Project Development Workshop: Integrating Biodiversity Information Management into the Curricula of Wildlife Training Institutions

WCMC Cambridge, 23-25 March 1999

FINAL REPORT

COMPILED BY SAM KANYAMIBWA AUGUST 1999

Facilitated by WCMC with support from UNESCO/WHC

WORLD CONSERVATION MONITORING CENTRE

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Preface

With the support of UNESCO/World Heritage Centre, the World Conservation Monitoring Centre hosted a Project Development Workshop on "Integrating biodiversity information management into the curricula of Regional Wildlife Training Institutions" in Cambridge, 23-25 March 1999.

The workshop was attended by the Directors of Wildlife Training Institutions from Argentina, Australia, Cameroon, Costa Rica, India, Tanzania, Republic of South Africa, United Kingdom, and United States of America and by observers from other institutions.

This workshop was a follow up to a Regional Training Centres' Workshop on Networking for Curricula and Training Materials Development for Protected Area Management, organised by UNESCO World Heritage Centre as part of their *"Strategy for training in the Field of Natural Heritage"* and hosted by Wildlife Institute of India at Dehra Dun, 20–24 April 1998. The workshop in India emphasised that protected area managers play a key role in providing information on protected area issues. Integrating biodiversity information management into the curricula of training institutions was considered important in assisting them to meet priority issues and concerns.

This document includes presentations made during the workshop, the results of an assessment conducted by WCMC in relation to the capacities and needs of Wildlife training Institutions in information management. It highlights the main topics discussed at the workshop and summarizes the priority actions and conclusions agreed. The workshop set up a consortium to promote cooperation among regional training institutions. The consortium has already established a web site based at WCMC and the report highlights follow up actions undertaken by WCMC after the workshop.

Acknowledgements

The Wold Conservation Monitoring Centre would like to express deep gratitude for the support of Wildlife Training Institutions that made the workshop on integrating biodiversity information management into their curricula possible and such a success.

This initiative was funded by UNESCO/World Heritage Centre. Special thanks are addressed to Dr N. Ishwaran for his efforts to this event and for encouragement along the way.

Grateful appreciation I also expressed to a number of people who contributed individually to the success of the workshop, particularly the co-facilitators (Prof. Eugene Moll, Mr Mukherjee and Mr Jerry Harrison) and Marc Hockings for reporting. Finally, we would like all WCMC staff who contributed to the workshop, particularly Amanda Smith for a hard administration work, Colin Watkins for great help on social activities and Susan White for putting together the report.

Sam Kanyamibwa

Contents

Preface
Acknowledgements
Workshop Programme

1. OPENING REMARKS

1.1 Welcome and Opening Remarks: *Dr N. Teall, Director of Knowledge Management (WCMC* 7
1.2 Key Note 1: Managing Biodiversity Information for Protected Area Management: *Tom Moritz (WCPA)* 15
1.3 Key Note 2: Training for Protected Area Managers: *Dr N.Ishwaran (UNESCO/WHC)* 43

2. WORKSHOP INTRODUCTION
2.1 Workshop Introduction: *Dr S. Kanyamibwa* 55
2.2 Participants' expectations of the workshop: *Prof. E. Moll* 59

3. CONCEPTS AND PRINCIPLES OF INFORMATION MANAGEMENT
3.1 Establishing Information Needs and Designing Information Products for Decision Makers: *Kent Cassels* 75
3.2 Networking, Access and Custodianship: *DrJohn Busby* 101
3.3 Building Institutional Capacity/Data Management Fundamentals: *Javier Beltran* 119

4. CURRICULA REVIEW OF PARTICIPATING INSTITUTIONS
4.1 Integrating Biodiversity Information Management into the Curricula of Wildlife Training Institutions: *Dr J.Ngog Nje* 145
4.2 School of Natural and Rural Systems Management, Gatton College University of Queensland: *Marc Hockings* 153
4.3 International Centre for Protected Landscapes: *Charlie Falzon* 157
4.4 College of African Wildlife Management, Mweka : Curriculum Review: *Dr David Manyanza* 165
4.5 Curricula Review of the Regional Wildlife Management Program for Mesoamerica and the Caribbean "PRMVS" (UNA, Heredia, Costa Rica): *Isa Torrealba* 169
4.6 Southern African Wildlife College – A five year vision 'Turning Concrete Reality into a Functional Reality': *Prof. Eugene J Moll* 175
4.7 Application of Modern Technology – Initiatives at the Wildlife Institute of India: *Rajesh Thapa* 191
4.8 Protected Area Resource Centres – Information on the ground for those who need it most: *Tom Moritz and Jeremy Harrison* 199

5. PRIORITISATION AND PROJECT DEVELOPMENT 203

6. WORKSHOP CONCLUSIONS AND RECOMMENDATIONS 207

7. ANNEXES
7.1 Annexe 1: List of participants 209
7.2 Annexe 2:Follow up and actions undertaken after the workshop
- *Web site of the World Conservation Training Consortium* 211
- *Project Proposal:* Pilot initiative with regional colleges in Africa 213

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WORKSHOP PROGRAMME

Day	0900-1040		1100-1300		1400-1600		1615-1730
Day 1 Tuesday 23 March ***Facilitator:Jerry Harrison*** Theme 1: Opening session Theme 2: Concepts and Principles of Information Management	***Chair: Mr S.K. Mukherjee, India*** 9:00-9:30: Arrival + Tour at WCMC. *Laura Battlebury* 9:30-9:40: Welcome by *Dr N. Teall, Director Knowledge Management, WCMC* 9:40-10:00: Key note 1: Managing biodiversity information for protected area management: *Tom Moritz (WCPA)* 10:00-10:20: Key note 2: Training for Protected Area Managers: *Dr N. Ishwaran (UNESCO/WHC)* 10:20-10:40: Workshop introduction/expectations: *Dr S. Kanyamibwa & Prof. E. Moll*	B R E A K	***Chair: Dr D. Navid, UNITAR*** Establishing Information Needs and Designing Information Products for Decision Makers *Presentation by* *Kent Cassels*	L U N C H	***Chair: Dr Ngog Nje Garoua, Cameroon*** Networking, Access and Custodianship *Presentation by* *John Busby*	B R E A K	***Chair: Isa Torrealba PRMVS, Costa Rica*** Building Institutional Capacity/Data Management Fundamentals *Presentation by* *Javier Beltran* *17:30-18:30 (Cocktails at WCMC)* *Dinner: Free*
Day 2 Wednesday 24 March 1999 ***Facilitator: Mr Mukherjee*** Theme 3: Establishing Needs Theme 4: Project Development for Integrating Information Management into the Curricula of Wildlife Training Institutions	***Chair: Dr D. Manyanza, Tanzania*** Curricula Review of Participating Institutions *9:00-9:20: Argentina* *9:20-9:40: Garoua* *9:40-10:00: Gatton Coll.* *10:00-10:20: ICPL* *10:20-10:40: Losehill* *11:00-11:20: Mweka*	B R E A K	***Chair: Dr E. Bucher, Argentina*** Curricula Review of Participating Institutions *11:20-11:40: PRMVS* *11:40-12:00: St Africa* *12:00-12:20: Colorado* *12:20-12:40: WII/India* *12:40-13:300: WCPA(PARC)*	L U N C H	***Chair: Prof. E. Moll, South Africa*** Project Development/ Priority-setting	B R E A K	***Chair: Prof. E. Moll, South Africa*** Project Development/ Priority-setting *Dinner: Free*
Day 3 Thursday 25 Marh 1999 ***Facilitator: Prof. E. Moll*** Theme 4 (cont.): Project Development and Theme 5: Establishing follow up and closing session	***Chair: Tom Moritz, WCPA*** Project Development/ Priority-setting	B R E A K	***Chair: Tom Moritz, WCPA*** Project Development/ Priority-setting	L U N C H	***Chair: C. Falzon, ICPL, UK*** ***Rapproteur: M. Hockings, Australia*** The Way Ahead: Conclusions and Recommendations	B R E A K	***Chair: Larry Lechner, Colorado University*** Workshop Assessment Closing: *Dr M. Collins, CEO, WCMC* *19:00: Farewell Dinner*

Monday 22 March (Welcome on arrival) - Friday morning 26 March (Cambridge Tour) **Coordination: Dr Sam Kanyamibwa**

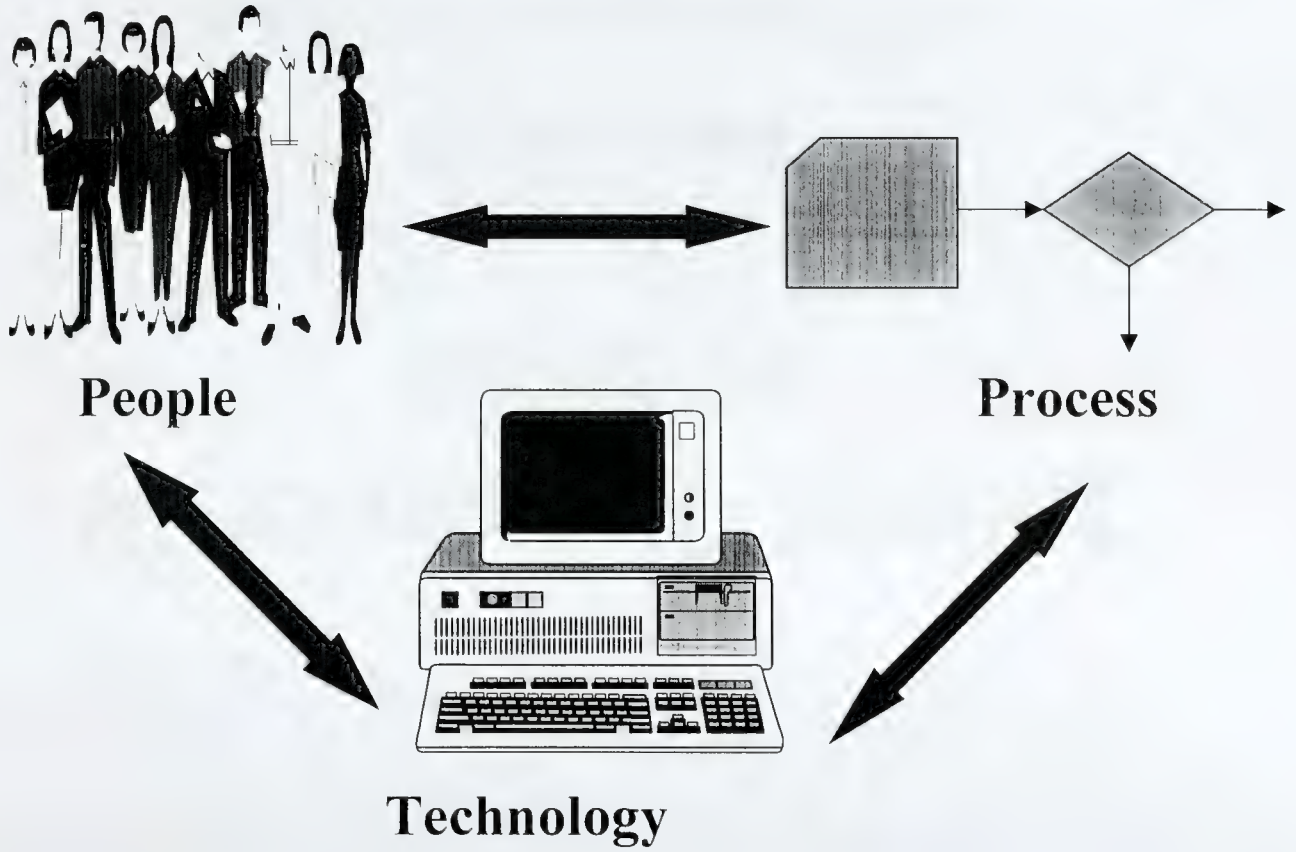
1. OPENING REMARKS

Welcome and Opening Remarks

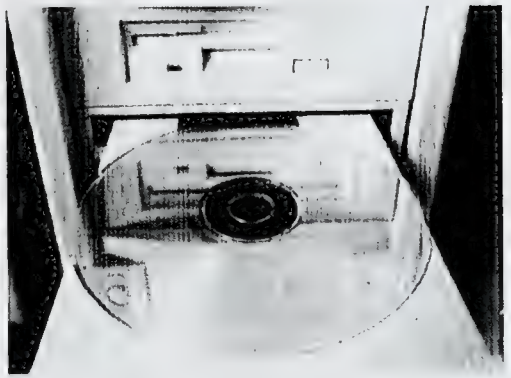
Dr Nick Teall

Director, Knowledge Management Services
World Conservation Monitoring Centre

Technology Alone Is Not the Answer

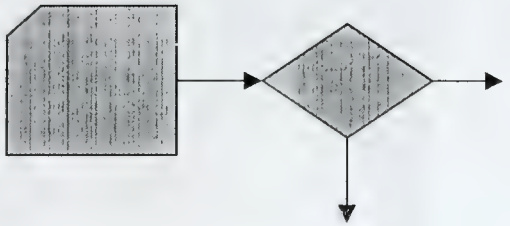


Keys to Success - Technology



- Used for strategic advantage to support our mission
- Investments in infrastructure; not admin. Expense
- Rather than just connecting machines, connecting people
- One-size does not fit all
- Continuous investments in changing technologies

Keys to success - Process



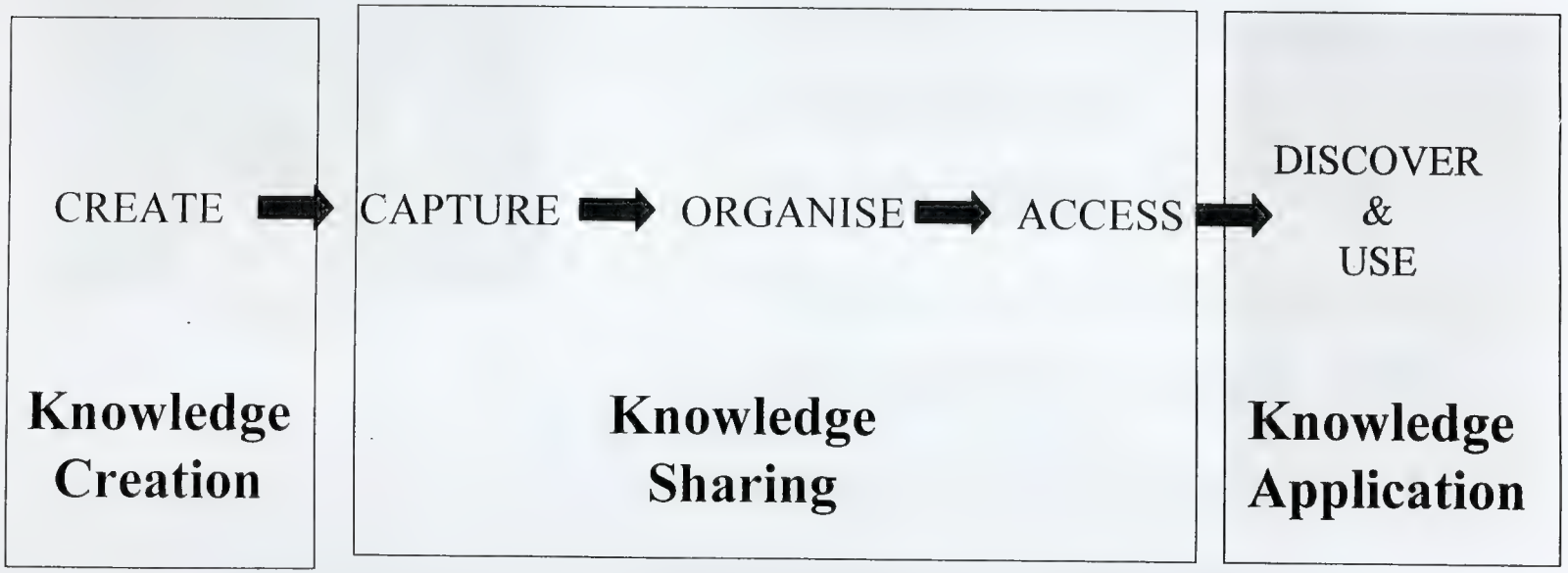
Process

- Building on experience
- Decentralise and right placement
- Partnering
- Streamlining
- Managing vs administering
- Knowledge transfer
- Faster and better decisions
- Learning & teaching

Keys to success - People

- Communicate with each other
- Co-operation & Collaboration
- Empower individuals
- Hold people accountable
- Work smarter
- Recognise success

Knowledge Process



If you think a year ahead …

…… Sow a seed

If you are thinking ten years ahead

….. Plant a tree

If you are thinking a hundred years ahead

… educate the people

Kuan Tzu 500 BC

Keynote 1: Managing Biodiversity Information for Protected Area Management

Tom Moritz

Chair, Information Management Task Force, WCPA/IUCN
and Director - Department of Library Services
American Museum of Natural History

Biodiversity Information for Managing PA's

What is "biodiversity" ?

Biodiversity refers to the broadly diverse forms into which organisms have evolved and is considered at three levels:

Genetic diversity: Variation in genes enabling organisms to evolve and adapt to new conditions.

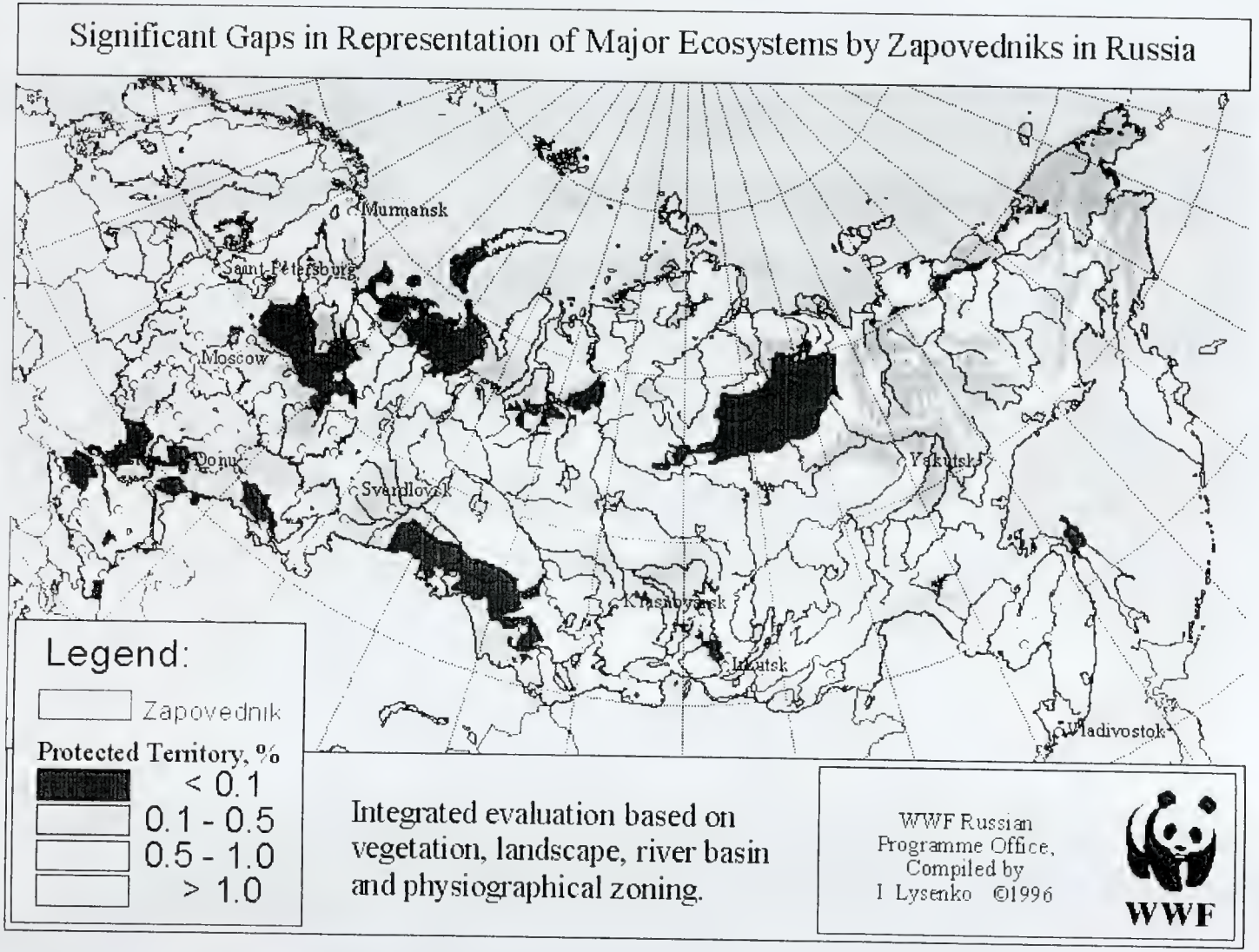
Species diversity: The number, types, and distribution of species within an ecosystem.

Ecosystem diversity: The variety of habitats and communities of different species that interact in a complex web of interdependent relationships.

Biodiversity
is the key factor
in gauging
the integrity and health
of natural systems

What are…?

- *"data"* -- observations or measurements recorded and reported in a standard way
- *"information"* -- reasonable associations of data
- *"experience"* -- Personal or collective recollection and interpretation of events
- *"knowledge"* -- rationale assumptions derived from the analysis of information and experience , presumed to be "*true*" and "*reliable*"


Significant Gaps in Representation of Major Ecosystems by Zapovedniks in Russia
Murmansk
Saint Petersburg
Moscow
Donu
Sverdlovsk
Yakutsk
Irkutsk
Vladivostok
Legend:
Zapovednik
Protected Territory, %
< 0.1
0.1 - 0.5
0.5 - 1.0
> 1.0
Integrated evaluation based on vegetation, landscape, river basin and physiographical zoning.
WWF Russian Programme Office, Compiled by I Lysenko ©1996
WWF

IUCN WCPA Protected Area Categories:

Ia./Ib.
Strict Nature Reserve/
Wilderness Area

II. National Park

III. Natural Monument

IV. Habitat/Species
Management Area

V. Protected
Landscape/Seascape

VI. Managed Resource
Protected Areas

Biodiversity Information for Managing PA's

The definition of a protected area adopted by IUCN is:

An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means

Biodiversity Information for Managing PA's

Biodiversity Information for Managing PA's

Although all protected areas meet the general purposes contained in this [IUCN] definition, in practice the precise purposes for which protected areas are managed differ greatly. The main purposes of management:

- → Scientific research
- → Wilderness protection
- → Preservation of species and genetic diversity
- → Maintenance of environmental services
- → Protection of specific natural and cultural features
- → Tourism and recreation
- → Education
- → Sustainable use of resources from natural ecosystems
- → Maintenance of cultural and traditional attributes

Convention on Biological Diversity

Article 8. In-situ Conservation

Each Contracting Party shall, as far as possible and as appropriate:

a. *Establish a system of protected areas* or areas where special measures need to be taken to conserve biological diversity;

b. *Develop,* where necessary, *guidelines for the selection, establishment and management of protected areas* or areas where special measures need to be taken to conserve biological diversity.

c. *Regulate or manage biological resources* important for the conservation of biological diversity *whether within or outside protected areas,* with a view to ensuring their conservation and sustainable use;

Convention on Biological Diversity

Article 8. In-situ Conservation [cont.]

d. *Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;*

e. *Promote environmentally sound and sustainable development in areas adjacent to protected areas* with a view to furthering protection of these areas;

Bis *Bison bonasus*) part of
reside reeding program in zapovednik

What are the chief *themes* of Biodiversity Information?

- Biological
- Ecological
- Geographic
- Legal / Jurisdictional
  - Vulnerability to extinction / extirpation
- Collateral: Social, economic, political, cultural

Biodiversity Information for Managing PA's

Biodiversity Information for Managing PA's

- *Types* of biodiversity information?
  - *Primary* -- observation/measurement
  - *Secondary* -- compilations of data/information: publications, data sets/databases, maps, field notes/descriptions
  - *Tertiary* -- analyses / prescriptive treatments (keys, field guides, Red Lists, management plans)
  - *Collateral* -- "threats", economic, demographic, socio-political, cultural

Biodiversity Information for Managing PA's

	Birds			
	All Species	**Endemic Species**	**Threatened Species**	**# per 10,000 sq. km.**
Mexico	1,026	89	34	180
Belize	533	0	1	405
Guatemala	669	1	4	304
El Salvador	420	0	0	329
Honduras	684	1	4	308
Nicaragua	750	0	3	322
Costa Rica	850	7	40	469
Panama	929	8	9	477
United States	768	70	46	79

Functions of PA's with respect to Biodiversity Information

- PA's are *sensors or nodes* in an international network supporting the establishment of baselines and the monitoring of changes in Biodiversity
- PA's are *core areas* in any comprehensive plan to manage ecosystems effectively
- PA's are dissemination points for Biodiversity Information

Biodiversity Information for Managing PA's

Who are *producers* of Biodiversity Information?

→ P.A. Staff

→ Field Scientists

→ Local/Indigenous Communities

→ "Naturalists" (amateur scientists)

→ Museum Scientists

→ Information Scientists/Managers

Biodiversity Information for Managing PA's

What are *uses* of Biodiversity Information in the PA context ?

- → Description -- (baseline surveys/inventories)
- → Management -- (sustained monitoring)
- → Reporting -- (legal/jurisdictional obligations)
- → Education/Interpretation
- → Scientific Research
- → Environmental Indication

Who Are Stakeholders in PA'S (Broadly defined?)
(i.e. potential *users* of PA-derived Biodiversity Information?)

Commercial Interests

Educators/Interpreters

Environmentalists / Conservationists

Govt. Administrators/ Legislators

Journalists

Landowners (Ecosystem)

Local Communities (Occupants) /Indigenous Peoples

NGO's

PA Policy Makers

PA (on-site) Staff

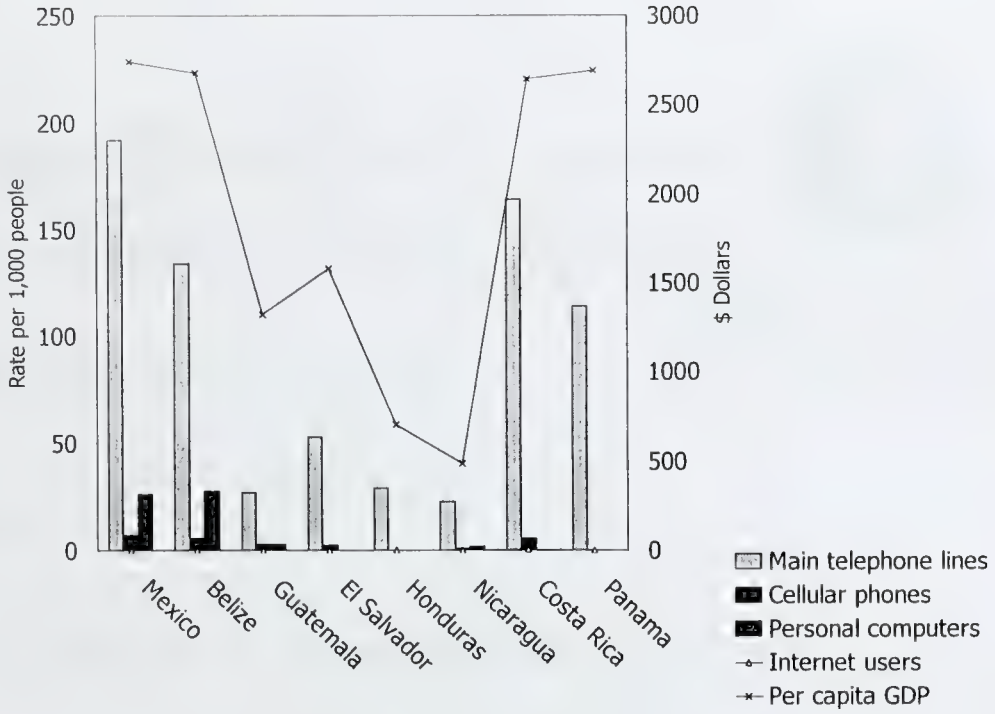
Recreationists

Scientific Researchers

Subsistence Consumers

What are constraints on PA's?

The *technological infrastructure*:



Biodiversity Information for Managing PA's

Other constraints:

Understaffing

Training and experience of staff

Sustained technical and financial support

Others…?

PARC: *Protected Areas Resource Centres*

A cooperative project of AMNH, IUCN/WCPA and WCMC

World Commission on

Protected Areas

WORLD CONSERVATION
MONITORING CENTRE

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Information Management Task Force
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http://www.WCMC.org.uk

Key Note 2:

The future of protected areas management training

Dr N. Ishwaran, Senior Programme Specialist
Natural Heritage, World Heritage Centre
UNESCO, Paris, France

INTRODUCTION

In a recent issue of *The Economist's* special section on *Innovation in Industry*, the authors had made the following observation :

« .....Wilbur and Orville Wright"s airborne achievement on the sands of Kitty Hawk in 1903 begged questions of fluid mechanics not solved until Ludwig Prandtl"s classic studies in Germany in the 1930s. William Shockley had to invent a theory of electrons and « holes » in semiconductors to explain why the transistor he and his colleagues at Bell laboratories had devised had actually worked. The invention of the transistor in 1948 transformed the sleepy backwater of solid-state physics into the biggest and busiest branch of physics »

The comparison of fluid mechanics and solid-state physics with protected area management as disciplines of the same order is perhaps far-fetched. Yet, most practioners of protected area management would be able to sympathise with the essence of the above mentioned quote : that the state-of-art of their practice has always been ahead of theoretical notions applicable to the design and functions of protected areas.

Protected area managers have had to adapt to changing expectations of academia, governments and the general public with regard to the functions of protected areas. The establishment of protected areas, since Yellowstone, has been largely driven by aesthetic and recreational considerations. Their rôle in the preservation of biological diversity has gained increasing recognition in more recent decades of this century. Island biogeography came to prominence because it claimed to provide a theoretical basis for the establishment and design of protected areas. Yet, it is quite obvious to protected area managers that biological explanations alone are unlikely to be sufficient to explain the necessity or the design of protected areas and to provide a basis for the management of such areas. The profession of protected area management, particularly in less developed countries, suffered a set-back as the notion of « paper-parks » was used to criticise many parks and equivalent reserves which were neglected by the authorities responsible for its management. The fact that such neglect could have been a result of decreasing resources available for investments into the protected area estate seems to have attracted little comment.

An environmental historian, Anna Bramwell (1994) has predicted that the « internationalisation of environmental issues will turn the national movements into a second-division affair ». Those of us from less developed countries who had the opportunity to move from national to the international arena of protected areas-related careers feel that Bramwell has an important point to make. It is our contention that the time has come now to give a clear definition to the domain of protected area management. As Laurence E. Lynn (1996) argued in the case of 'public management', giving definiton relates to the understanding of the relationship between « knowledge and practice » and finding out ways and means by which universities and similar training and research institutes can contribute towards creating and sustaining that relationship. We feel that this is an essential first step in raising the profile of protcted area management as a profession and increasing its attraction to the next generation of young people who will come into the employment market in search of new and challenging career opportunities.

CHANGING KNOWLEDGE BASE OF PROTECTED AREA MANAGEMENT PRACTICE

While laws may have strictly proscribed entry of any persons into a protected area without legal permission, managers often used their sense of judgement in informally accepting subsistence level extraction of resources by local communities. There have been several examples of resident villages (see Ishwaran, 1993 for an example from Sri Lanka) in protected areas whose existence were permitted by authorities. Young persons from such villages had been absorbed into the staff cadres of the Government departments responsible for protected area management.

Since the 1970s however, accomodating to the needs of local communities has been raised to the level of a principle of protected area management. UNESCO's Biosphere Reserve Concept was one of the earliest in promoting this principle. At present, various ICDPs (Integrated Conservation and Development Projects), such as biosphere reserves, ecosystem management areas, bioregional planning units etc. have become popular and the preferred tools of intervention for the international community of donors with regard to providing assistance to protected areas.

An interesting research question for future studies on international environmental relations would be: what impacts has the worldwide promotion of ICDPs, since the early 1970s, have had on the establishment and management of protected areas? The conceptual links established between economic development and environmental conservation could have had a favourable influence on leaders and decision makers and convinced them of the fact that setting aside national parks and similar reserves need not essentially preclude the use of those areas in economic development. This could have contributed to the significant rise observed in worldwide establishment of protected areas during the last 2-3 decades (IUCN, 1994). For example, in India, the number of protected areas grew from a «modest 65 national parks and sanctuaries in 1960» to 445 at the end of 1989 (Kothari et. al. 1989). Similarly in China, the number of protected areas grew from about 19 in 1966 to about 333 in 1986, and is expected to grow to about 500 by the year 2000 (Wen Hua & Xianying, 1989)

Globally, the average size of a protected area began decreasing in the late 1980s (IUCN, 1994). Conservationists have increasingly become aware that the future of protected area management lay in attempts to link biodiversity conservation in protected areas to sustainable

development initiatives that minimise biodiversity loss and stablise biodiversity status outside of such areas. Growing interest in the «performance and prospects of projects trying to translate concepts of biodiversity conservation and sustainable socio-economic development into effective on-the-ground activities in developing countries» (Wells, 1995) is hence timely. Successful on-site ICDP operations clearly depend on the co-operation and co-ordination among a wide range of Government and non-government organisations. From a protected area management perspective, the shift in emphasis from the conventional "national park" paradigm to ICDP approaches, had been accompanied by major changes in the knowledge and skills-set that a protected area manager is expected to have.

The manager needs new knowledge and skills to communicate, negotiate and resolve conflicts and to establish agreements and co-operative mechanisms for implementing ICDPs, quite different from the knowledge and skill-set he had acquired for policing protected areas, restricting resource use by local people and studing unique flora and fauna found within the boundaries of the protected area. The growth in the knowledge and skills requirements of the manager has continued to expand as notions of biodiversity and ICDP have become popular, and the pool of funds mobilised on behalf of such notions has increased. With regards to biodiversity, Sanderson and Redford (1997) have noted: "Agricultural scientists concerned about crop germplasm erosion, became advocates of biodiversity conservation. Ethnobotanists, studying how traditional peoples maintained crop cultivars, joined them. Anthropologists, interested in the loss of traditional cultures pointed out that if traditional ways were not maintained, biodiversity would suffer. Advocates of endangered species, particularly species in zoos, took up the cry for biodiversity conservation. The pharmaceutical industry, prospecting for new drugs in wild plants, became biodiversity conservationists. And indigenous and traditional people, sensing the power of their position, became self-styled defenders of biodiversity". The protected area manager is often faced with the unenviable task of co-ordinating activities which are designed on the basis of inputs from a variety of such knowledge streams and power bases, most of which claim that those activities have been designed in order to demonstrate operational linkages between biodiversity conservation and socio-economic development: Despite the fact that a protected area manager's task has been rendered immensely complicated by the necessity to co-ordinate such a wide range of interests, the recognition of the expanding rôle of protected areas in biodiversity conservation and socio-economic development also create opportunities for the strengthening the "power base" and the professionalisation of protected area management. Unfortunately, those opportunities have not been favourably utilised for strengthening the capacity for protected area management, particularly in less developed countries. Biodiversity and environmental conservation have become very much sought after career options at the international level, as multi- and bi-lateral aid-agencies have incorporated them as important policy goals in their agendas for development co-operation. In less developed countries, however, the attractiveness of protected area management as a career option to youth is almost negligible. Most young persons still opt for "prestigious" careers linked to medical, engineering, business and academic professions.

On the other hand, opportunities arising from the growing appreciation of the linkages between socio-economic development and environmental conservation has led to a rapid growth in NGO-interest in the field of environment, and NGOs have become preferential recipients of donor funding, since most donors consider NGOs to be the most suitable and effective group for delivering outputs expected from the implementation of ICDPs. Princen and Finger (1994) have pointed out that while the global number of NGOs grew from 176 in 1908 to 4,518 in 1988, "almost all environmental NGOs, networks and coalitions were started

in the 1980s". The increases in the number of environmental NGOs at the country-level too, are quite staggering; "In Indonesia, for example, WALHI, the Indonesian Environmental Forum, was formed by seventy-nine NGOs in the 1980s, had grown to over 320 NGOs by 1983, and in 1992, had over 500 members. India has some 12,000 development NGOs and probably hundreds of thousands of local groups. Bangladesh has more than 10,000 environment-related NGOs, of which about 250 receive funds from foreign sources" (Princen and Finger, 1994).

The involvement of NGOs in the design and implementation of ICDPs has brought with it a vast pool of young and qualified people who are willing to commit themselves towards the cause of biodiversity conservation. However, there has been very little incentives given to NGOs to demonstrate their willingness and ability to work in a complementary manner supporting the efforts of government departments responsible for protected area management. As Wells (1995) had pointed out "NGOs usually seem better than governments at using people-oriented approaches to environmental conservation. In practice it is common for conservation NGOs to try to ignore government agencies, to work around them, or to target sites which are so remote that the agencies have little interest in what happens there".

Given the long term nature of the commitment which the management would have to be prepared to make to design and execute a successful ICDP operation (for example, in the case of the Fitzgerald River Biosphere Reserve of Western Australia the time frame of commitment needed was about 15-20 years (Watson and Saunders, 1997), continuity of the management infrastructure and personnel available for implementation will be critical in determining success. Capacity building initiatives for ICDPs, apart from putting in place the necessary legislative and management planning frameworks and broadening participation in management to include NGOs, academic and research communities and local people, must also build-in training schemes and other prerequisites necessary to develop a core-cadre of personnel, who can provide continuity to the long-term strategic planning and management needs of ICDPs. At least in less developed countries this core-cadre of personnel must be chosen from relevant government departments or ministries dealing with forestry, wildlife, national parks, environment, finance and planning, tourism, social services and rural development.

Training of managers is needed at both the site and system level. Knowledge and skills for conservation advocacy and for negotiating with international development agencies essential for drawing the support of a broad range of stakeholders critical to the successful implementation of ICDPs are needed. The profile of a protected area manager must become equivalent, if not comparable to that of a regional development planner, if he/she is to have the power and the capability to ensure biodiversity protection within protected areas and introduce biodiversity conservation as an important objective in sustainable development planning outside of such areas. Training courses designed for protected area managers, conventionally dominated by natural sciences disciplines, need to reach out to select materials from curricula used by the social sciences and management studies. The manager must be trained to: (i) articulate and define problems; (ii) solicit the support of research institutes and NGOs to carry out necessary studies to analyse problems and recommend options for solutions (iii) discuss the different options with stakeholders at the local, national and international levels, to identify the mix of actions in favour of biodiversity protection, sustainable resource use and socio-economic development; and (iv) plan, design and implement programmes and projects to execute those actions and monitor and evaluate the outcomes with a view to making changes as and when needed. The manager must be

encouraged to develop the 'scientific' attitude whereby he or she views management strategies and interventions as hypotheses to be tested ; i.e. their predicted outcome should be stated explicitly and the time frame for monitoring and evaluating the outcome of management interventions must be defined (Peterson,1996).

In building capacity for protected area managers who can improve the performance of ICDPs, there are questions concerning "limits" which needs to be kept in mind and answered, particularly when designing training programmes and curricula for future managers. Should a protected area manager's role in the design and implementation of an ICDP be restricted to those aspects dealing with: (i) biodiversity protection in the core; and (ii) providing for people in the buffer and transition zones, alternatives for biodiversity resources located in the core and on which the people's income and livelihood depend? Or should the manager be encouraged to seek out resources for the implementation of rural development schemes which, though they may not have any direct benefits for biodiversity conservation, may win for the manager the goodwill of the people resident in and around the protected area? Based on a study on the Okomu Forest Reserve of Nigeria, Oates (1995) has cautioned against the dangers of conservation by rural development.

Protected area managers' principal duties would have to centre around biodiversity protection and conservation, and facilitating sustainable use projects which are in conformity with those long-term biodiversity protection and conservation objectives. A manager may still facilitate the people resident in and around protected areas to gain access to rural development resources, including information, by providing contacts with appropriate government agencies, NGOs and international organisations. Direct involvement of protected area managers in the design, planning and implementation of rural development projects may take time away from their core duties pertaining to biodiversity protection and conservation. It may be argued that a manager who is seen to be active in the promotion of rural development projects may win sympathy among villagers who therefore may pose minimal threats to the integrity of the boundaries of the protected area whose management is his/her responsibility. However, promotion of run-of-the mill rural development projects may compromise that managers' ability to introduce new ideas and innovative projects which may reduce the dependence of the local people on land and biodiversity resources and hence increase opportunities to release or set aside land outside of protected areas where biodiversity could recover. As the manager is compelled, more and more, to focus outside of the boundaries of the protected area, the manager must be encouraged to give more thought and time to experimenting with ways and means to improve the biodiversity status of areas which have been degraded. In the absence of efforts to recover degraded areas for the revival of biodiversity components, they are likely to be converted to monocultures as part of industrial agricultural and plantation schemes.

A key component of our efforts to 'giving definition to the domain' of protected area management must include training that enables the prospective manager recognise that there are limits to compromises that he or she would have to make in accommodating economic development concerns. In the implementation of the World Heritage Convention, with regards to natural heritage sites most of which are protected areas, finding a compromise between conservation of the site and accommodating economic development in surrounding areas is increasingly the most important task. The site-management's ability to enter into informal coalitions with international and national conservation NGOs and international organisations and Committees promoting heritage conservation has been vital to resolution of conflicts in Yellowstone National Park of the USA as well as in Galapagos Islands of Ecuador. At

present, there are about 8 to 10 natural World Heritage sites whose integrity is under threat by proposed mining activities immediately outside of their borders. In some cases accommodation may be feasible while in other cases the conflict is likely to persist for considerable periods of time in the future. The protected area manager of the future will face industry and trade representatives who are increasingly sensitive to environmental damages which their activities are likely to cause and who have the capacity to propose and finance mitigation measures that are likely to meet with legal requirements set by Governments. The power-base and the diplomatic and negotiation skills of the protected area manager and those who are supporting the cause of conservation must rise to match that of their countreparts in industry and trade relations if they are to be able to secure the best options for conservation vis-à-vis their participation in decision making processes inolving a wide range of actors and interests.

PROTECTED AREA MANAGEMENT TRAINING OPPORTUNITIES IN THE IMPLEMENTATION OF THE WORLD HERITAGE CONVENTION

The following articles of the World Heritage Convention provide justifications for establishing links between the development of protected area management as a discipline and the operations of the Convention:

Article 5 (e): calls upon "each State Party to this Convention.....in so far as possible, and as appropriate for each country"

> to foster the establishment or development of national or regional centres for training in protection, conservation and presentation of the cultural and natural heritage and to encourage scientific research in this field.

Article 22(c): in describing the different types of assistance that may be granted by the World Heritage Committee,

> Training of staff and specialists at all levels in the field of identification, protection, conservation, presentation and rehabilitation of the cultural and natural heritage

Article 23:

> The World Heritage Committee may also provide international assistance to national or regional centres for the training of staff and specialists at all levels in the field of identification, protection, conservation, presentation and rehabilitation of the cultural and natural heritage

Since the implementation of the Convention became operational in 1978, approximately US$ 3-4 million has been spent on training specialists concerned with the protection and conservation of natural heritage. During the early years, until about 1984, individual fellowships were the principal form of training assistance provided under the Convention. Afterwards, emphasis was placed on the organisation of short-term (up to a maximum of about 8 weeks) training workshops, including that of a few regional mobile-training seminars. The primary beneficiaries of the training grants offered under the World Heritage Convention were the regional training centres such as the Mweka College of African Wildlife Management (Tanzania), School for Training Specialists in Wildlife (Garoua, Cameroon), and the Centro Agronomico Tropical de Investigacion y Ensenanza (CATIE, Costa Rica). In the

1990s, the Wildlife Institute of India (WII) also began to receive grants for the organisation of training activities.

As the number of natural heritage sites grew (currently 117 of the 582 World Heritage sites are natural areas; 20 of the rest of the 465 sites are mixed, i.e. they are recognised for natural as well as cultural heritage values), *in-situ* training activities that include field exercises have become a priority. Training activities whenever possible need to be organised in a national park or a similar reserve recognised as a World Heritage site. In the event that a State Party does not have a natural World Heritage area, then the *in-situ* training activity could be organised in some other protected area of international significance, such as a Ramsar site, or a biosphere reserve.

In 1995, a consultant was called upon to review the experience of designing and organising training activities under the World Heritage Convention with a view to elaborating a strategy for the future (Navid, 1995). He observed that "in the case of individual fellowships, it is interesting to note that there has been a definite shift away from supporting long courses of study (in excess of six months), which usually took place outside of the region of the applicant, in favour of support for short courses and seminars". Furthermore, he also observed a shift "in favour of increased support for group training as opposed to individual fellowships".

The outcome of the report included in Navid (1995) was a follow-up experts meeting hosted by the US National Parks Service, at the Albright Training Centre at the Grand Canyon National Park, from 28 August to 1 September 1995. The meeting led to the elaboration of a Strategic Action Plan for Natural World Heritage Training Programme (UNESCO, 1995). The plan was adopted by the nineteenth session of the World Heritage Committee held from 4 to 9 December 1995 in Berlin, Germany. The Plan defined four strategic actions:

1. Develop curricula and information materials on the World Heritage Convention and its implementation as basic materials for the World Natural Heritage Training Programme;
2. Develop a series of World Heritage Regional Training Workshops;
3. Develop World Natural Heritage Information Networks
4. Provide scholarships and study grants to site managers and others directly involved in the implementation of the World Heritage Convention.

The Plan called for the compilation of case studies with regard to Actions 1 and 2. Under Action 1, activity (A) (iii) suggested that "case studies illustrating the use of the Convention for the conservation of natural heritage sites of "outstanding universal value" be compiled and published. Activity (A) (ii), of Action 2 proposed to "compile case studies which will have illustrative value of the work of the Convention".

Activities B and C of Action 1, are also relevant to the compilation of case studies. Activity B called upon the World Heritage Committee and related organs to "develop training modules .....on natural heritage properties" on themes such as: tourism; community relations; other related Conventions; site management including planning, protection, conservation and monitoring, and implementation procedures. Activity C of Action 1 proposed that the training modules prepared are tested and evaluated for their effectiveness and revised and updated as necessary.

The experience of the implementation of the Convention could be analysed and documented as case studies applicable to two different sets of disciplinary clusters:

- The application of the Convention at the international, regional and national levels: case studies could have relevance to disciplines such as international environmental law, international relations, national conservation legislation and perhaps for the fledgling discipline of international environmental diplomacy;

- The application of the Convention to site-protection, conservation and management. Here case studies are intended to enable trainees to understand concepts and practice of protected area management and related disciplines such as wildland management, wildlife conservation etc. For example, studies on the control and eradication of invasive species in important World Heritage sites such as Galapagos (Ecuador) and Aldabra Atoll (Seychelles) could be presented as case studies from which lessons concerning this aspect of protected area management may be drawn for the benefit of the trainee-practitioner.

The presentation of case studies on protected area management has a wide range of options and the technique of writing such case studies may require some investigation with a view towards standardisation. In a workshop on the « Role of Local Communities in the Management of World Natural Heritage Areas » at the Thungyai Huay Kha Khaeng Widllife Sanctuaries in Thailand, in January 1998, case studies presented covered a wide range. The representative of the Wet Tropics of Queensland, Australia, described how the designation of the area as World Heritage led to a fundamental shift in the principal revenue generator of the region from forestry to tourism industry. The site-manager of the Shirakami Sanchi World Heritage area took up a simple issue of the contents of a sign-board prohibiting entry to visitors in one part of the protected area. Using the proceedings of the various meetings which resulted in the final agreement with respect to text used in the sign board he demonstrated the extent to which even such a simple issue could generate intense conflict. The participants, most of them middle-to-senior level staff of individual World Heritage sites of Southeast Asia, Australia and New Zealand, suggested that the preparation of training modules and manuals for site-staff would be better accomplished following a specific needs analysis undertaken on the management theme under consideration. Currently, such a training needs analysis of site managers of Southeast Asia, Pacific, Australia and New Zealand, with regard to the role of local community participation in the management of sites, is underway with financial assistance from the World Heritage Fund. At present, site managers meetings and exchanges are increasingly promoted as a way of bringing the Convention's financial resources available for training to the direct benefit of site-managers.

Opinions of experts and professionals who have been associated with the work of the Convention vary with regard to the set of disciplinary clusters which should be the target of benefits deriving from the implementation of the Strategic Action Plan. Case studies illustrating how the Convention had benefited site protection, in Galapagos (Ecuador), or in Yellowstone (USA), are important perhaps for understanding the tactical use of international environmental law and/or diplomacy to enhance the goals of protected area management. Yet, the 117 natural and the 20 mixed sites inscribed on the World Heritage List provide a significant sample for identifying and describing case study examples, or in Barzelay's (1993) words "relatively narrow slice(s) of experience", which could be of interest and importance to the protected area management trainee. In the implementation of the Strategic Action Plan the World Heritage Centre and other concerned UNESCO sectors need to assign adequate importance to documenting such case study examples. Activity B, of Action 1 of the

Strategic Action Plan which calls for the preparation of training modules on selected themes provides interesting opportunities for combining conceptual and theoretical analysis with case studies from World Heritage sites in order to optimise the learning value of the training modules. The regional training centres in Africa, Asia and Latin America which continue to receive regular training support from the World Heritage Fund may be called upon to test and evaluate the effectiveness of the modules within their respective geographic regions.

The operations of the Convention already provide several opportunities where the prerequisites for case study development occur and could be immediately exploited. Some examples include:

- Annually, reactive monitoring reports submitted by the World Heritage Centre and IUCN to the sessions of the Bureau and the Committee identify potential threats to the integrity of the World Heritage sites. Efforts to mitigate these threats should optimally require the initiation of studies that define factual contexts, collation and collection of necessary data and their analyses, and recommending specific measures for implementation by the States Parties, the Centre, IUCN, the Bureau and the Committee;

- The Committee has activated the requirement of Article 29 of the Convention whereby States Parties to the Convention are being invited to submit periodic reports on the implementation of the Convention and established a time table as indicated in the table below. Fulfilling this requirement provides opportunities for establishing World Natural Heritage site/Research and training institutes partnerships at the national and/or sub-regional levels which could, amongst others, treat the generation of case studies as one of the principal goals of co-operation;

Region	**Examination of properties inscribed up to and including**	**Year of examination by the committee**
a. Arab States	1992	2000
b. Africa	1993	2001
c. Asia and the Pacific	1994	2002
d. Latin America and the Caribbean	1995	2003
e. Europe and North America	1996/7	2004/5

- For all large-scale international assistance projects (i.e. receiving contributions above US$ 50,000 from the World Heritage Fund) the Committee may consider introducing an obligatory requirement that project evaluation be conducted and documented in a previously agreed upon case study format; and

- Special case study writing workshops may be designed and conducted for teams of site-managers and research personnel as part of the implementation of the Strategic Action Plan for Training Specialists in Natural Heritage.

This workshop for integrating biodiversity information management into the curricula of the Regional Training Centres, is in itself a direct outcome of the first meeting of the Regional Training Centres held at the Wildlife Institute of India (WII), Dehra Dun, India, in April 1998 to discuss the implementation of the Strategic Action Plan for Training Specialists in Natural Heritage. Information management was suggested as a « functional area » for curriclula development together with six other such functional areas : natural resources protection ;

resource and habitat management ; working with stakeholders and stakeholder participation : tourism management ; protected area administration ; and infrastructure development. We hope that similar project development workshops could be launched for the other six functional areas too, in the coming years.

The current workshop, although intended to focus on « biodiversity information » will hopefully keep in mind the necessity and importance of gethering information concerning the human and budgetary resources essential for protected area management. While resources for international aspects of protected area management has expanded over the last two decades, it may be conjenctured that parallel increases at the national levels of staff and financial resources have been less forthcoming. Large countries like China for example, which have established a significant number of protected areas since the mid-1960s are now actively seeking support from international organisations and expertise for building capacity of their staff and are willing to make available financial resources necessary at the national level for staff training. This may not be the case in smaller countries. A co-ordinated global survey of the changes in the human and financial resources that are being made available by Governments, NGOs and international organisations for protected area management capacity building could provide valuable information for strategic planning purposes for the coming decades of the new millenium.

CONCLUDING REMARKS

The Economist survey referred to in the introductory section of this paper argued that « innovation has more to do with the pragmatic search for opportunity than with romantic ideas about serendipity, or lonely pioneers pursuing their vision against all the odds » Roles and functions of protected areas have adapted to shifts in conceptual models for conservation, ranging from strict protection to inetgrated conservation and development. But availability and accessibility of training opportunities for the protected area manager for developing the necessary skills and functions to keep pace with such conceptual changing have not always been forthcoming. The pragmatic endeavour of enhancing training and personal development opportunities available for, and accessible to the protected area manager is perhaps the next innovation-challenge facing the international conservation community. Addressing that challenge effectively and successfully would be critical for ensuring that protected areas play an important function in society and for elevating the prestige and social status of protected area management as a career option for young professionals.

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2. WORKSHOP INTRODUCTION

Introduction to the workshop

Sam Kanyamibwa

1. Link to previous activities

This initiative constitutes a follow up on a "Regional Training Centres' Workshop on Networking for Curricula and Training Materials Development for Protected Area Management, Wildlife Institute of India, Dehra Dun, India 20–24 April 1998

- The workshop was organised by UNESCO World Heritage Centre (Dr Ishwaran) as part of their *"Strategy for training in the Field of Natural Heritage"* and hosted by Wildlife Institute of India at Dehra Dun.
- Participants included delegates from following institutions: CATIE (Costa Rica), Mweka College of African Wildlife management (Tanzania), South African Wildlife College, Fort Colorado Collins (Mr Craig McFarland, USA), IUCN/WCPA (represented by Dr Peter Valentine), Gatton College (Marc Hockings, Australia), UNITAR (Dr Dan Navid) and WCMC. Apologies from The School for the Training of Wildlife Specialists of Garoua, Cameroon.
- Three working groups were established on three main topics: curricula development, training materials and networking between training centres.
- Agreed functional areas for curricula development include:

1. Natural Resource Protection
2. Resource/Habitat Management
3. Working with STKS/STKS Participation
4. Tourism Management
5. Administration
6. Infrastructure Development
7. Information Management

2. Rationale and justification

The contribution of protected areas to the sustainable use of natural resources is widely endorsed, as stipulated in the Convention on Biological Diversity (e.g. Article 8 - *In situ conservation)*. Furthermore, there is growing recognition that underpinning sustainable use is the management and provision of well-defined and timely information.

Through support from the United Kingdom's *Darwin Initiative for the Survival of Species*, WCMC has developed a comprehensive programme of training in biodiversity information management. This programme, aimed at senior decision-makers and mid-career professionals, comprises an international training team, drawing on expertise from collaborating organisations

around the world; the preparation of a training resource in the form of a handbook series and related materials; and the development of computer-based demonstration tools.

As the training programme has evolved, there have been a number of developments in support of an initiative aimed at wildlife training institutions. These include:

- Demand from various sectors, including wildlife, forestry and species groups to extend and adapt the training programme and materials developed to meet particular sectoral needs;
- Pilot testing and subsequent review of training in biodiversity information management aimed at park management staff and academics (e.g. in Region XI of Chile);
- Positive feedback from protected area personnel involved in information management
- training as part of larger postgraduate courses in biodiversity conservation and
- sustainable development (e.g. MSc entitled Global Biodiversity: Conservation and
- Monitoring run in collaboration with Ecosurveys Ltd and Hull University); and

- Direct support for such a programme from wildlife training institutions. This concept was presented at the "Regional Training Centres' Workshop on Networking for Curricula and Training Material Development for Protected Area Management", organised by the World Heritage Centre, Unesco in collaboration with the Wildlife Institute of India, Dehra Dun from 20-24 April 1998, and was underscored as a fundamental area for curriculum development.

The workshop in Dehra Dun, India emphasised that protected area managers play a key role in providing information on protected area status, threats and biodiversity resources. Training in biodiversity information management was considered important in assisting these professionals to meet priority issues and concerns. The present initiative therefore aims to work with wildlife training institutions to provide training in this area, thereby enabling managers to respond to increasing demands for biodiversity information which supports the sustainable use of resources in and around protected areas in general, and World Heritage Sites in particular.

3. Objectives of the project development workshop

The workshop aimed to achieve the following objectives:

- To identify institutional needs with respect to training in biodiversity information management;
- To identify priorities for project development bringing WCMC together with participating institution's expertise to meet those needs; and
- To identify suitable mechanisms for providing support to wildlife training institutions in their training programmes for protected area managers.

4. Expected phases for the initiative

It is anticipated that this initiative will consist of three main phases (to be discussed and confirmed at the project development workshop). The current project development workshop covers Phase I, aimed at identifying needs and formulating a strategy for integrating biodiversity information management into the curricula of wildlife training institutions.

- Phase 1 (User Needs Assessment) will identify the training needs of wildlife institutions in biodiversity information management as related to their curricula, and will also examine aspects of implementation. There is increasing demand for training in this area which is currently not being covered to any great extent by wildlife training institutions. Topics to be considered in the context of curricula development include the link between information and policy, conducting user needs assessments, information product design, access and information networks, data custodianship, building institutional capacity, and data management fundamentals. Phase 1 will be supported by a questionnaire and active participation from training institutions.

- Phase 2 (Preparation of Training Materials) concerns development of training materials adapted to the curricula of wildlife training colleges. Through support from the United Kingdom's *Darwin Initiative*, WCMC has prepared curriculum materials in the form of a handbook series and computer-based training aids. These are aimed at senior decision-makers and mid-career professionals. The project will seek to adapt these according to the needs of wildlife training institutions, derived from the first phase of the project.

- Phase 3 (Implementation) will involve technical support in training through use of materials prepared. Therefore, the project will not only prepare the training materials, but also support institutions in the application of those materials. This phase will initiate a sustainable process of reviewing and applying the curricula based on locally identified needs.

Participants' expectations of the workshop

Prof Eugene Moll

The user needs assessment was conducted through a questionnaire distributed to participating institutions before the workshop. During the workshop, participating institutions had also the opportunity to present their activities, needs and expectations from the initiative:

- In general, most institutions are involved in use, production and dissemination of information, but few have well developed technical information management capacities;
- Participating institutions are interested in improving the delivery of training through collaborative development and sharing of information and value-added resources - training modules, training materials and case studies;
- Capacity building, training and development of common understanding need to come early in the project life cycle because it is the key to sustaining projects in the long term;
- Participants at the workshop showed the need to increase collaboration between institutions, more efficient sharing of resources and development of common approaches through networking;
- There is a need to increase professionalism at the site level through the training of protected area managers and by equipping them with standard tools to evaluate their management effectiveness.

For more details on the needs of participating institutions, see the following results of the user needs assessment questionnaire

RESULTS OF QUESTIONNAIRE ASSESSMENT

1. Number of institutions covered: n= 6

2. Type of institution

Type	Number	Type	Number	Comments
Governmental	III	Semi-governmental	III	
Private	I	Non-governmental	I	
Profit		Non-profit	II	
Charity		Other		

2.2 Level of operation of institutions

Local	III	
National	IIIII	
Sub-regional	IIII	
Regional (Continental level)	IIIIII	
International	IIIIIII	

3. Programmes/ activities of participating institutions

3.1 Primary / secondary orientation of training programmes?

Programme Area	Primary	Secondary	Comments
Protected area management	IIIIIII	I	
Wildlife management	IIIIII	I	
General environmental management	IIII	III	
Community management	II	I	
Community development	IIII	II	
Other	I		EIA &Applied Research
	I		Species ecosystem and conservation
	I		Human dimension of conservation and wildlife management

3.2. Topics/skills addressed in the programmes?

Topic	Primary	Secondary	Comments
Cultural resource management	III	III	
Natural resource management	IIIII	I	
Legal issues	III	III	
Policy	IIII	I	
Trade	II	II	
Information collection and monitoring	IIII	II	
Information dissemination/education/interpretation	IIII	II	
Database management	II	IIIII	
Research/monitoring skills	IIIII	I	
Field skills (anti-poaching, law enforcment, etc.)	IIII	I	
Administration skills	III	III	
Communication skills	III	III	
Community/resource users management	IIIII	I	
Collaboration/networking	II	III	

3.3
Origin of students attending training programmes, their previous background and future professional activities.

Professionals	Graduates	Field Staff	NGO	PA Managers	Comments
IIII	IIIIII	II	II	II	

3.4 Programmes, modules or projects undertaken by institutions in relation to information collection, management and use.

Programme/Module/Project	Comments
Part of MSc modules	ICPL, PRMVS
GEF Projects	Garoua
Field trips to Dja Faunal Reserve	Garoua
National Wildlife Database	WII
Integrated Protected Area Network	WII
Spatial database for PA management (Tadoba-Andheri Tiger Reserve	WII
Wildlife Forensic Programme (hair analysis)	WII
Snow Leopard Information Management System (SLIMS)	WII
Himalayan Biodiversity Project	WII
Environmental Information System(ENVIS) for PA and wildlife species	WII
Biodoc (Biological Documentation Centre)	Implemented by Córdoba, goal is to gather unpublished information at a local level.
Units on monitoring	Colorado
GIS	Colorado
Outreach programmes directly with rural communities	PRMVS

3.5 Involvement of institutions or staff in the management/ research of any protected areas, particularly a World Heritage site?

Protected Area	Information	Comments
Sagamartha NP	Research into ecotourism	By ICPL
Transboundary PA's in Africa	Research	By ICPL
Keoladeo Ghana NP		By WII
Kaziranga NP		By WII
Gir NP		By WII
Nanda Devi NP		By WII
General	Development of management plans, Give advice on wildlife management	Córdoba
General	Research, training and technical assistance to WH sites and other PAs	Colorado
Coco Island WH site	Management/research	PRMVS
Palo Verde, Corcovado NP and Carara Biological Reserve	Wrote the management plan for Palo Verde NP and the EIS for Irrigation project	PRMVS
Mt Meru Game Reserve	Management/research	Mweka

4. Information holdings/needs/uses

4.1 Management/use/needs of following information

Protected areas information	Manages	Uses	Needs	Comments
Legislation	III	IIIIIII	IIII	
Natural resources management	III	IIIIIII	IIIIII	
Habitat management	III	IIIIIII	IIIIII	
Community involvement in protected areas	III	IIIIIII	IIIIII	
Socio-economic aspects and protected areas	III	IIIIIII	IIIII	
Tourism and protected areas	III	IIIIIII	IIIIII	
International sites	II	IIIIII	III	
Community/Private owned protected areas	II	IIIIII	IIIII	
Research/monitoring in protected areas	IIII	IIIIIII	IIIIII	
EIA	I	I	I	WII, Mweka

Physical Features	Manages	Uses	Needs	Comments
Landscape assessment		I		ICPL
Satelite Images	I	I	I	Córdoba
Geomorphology		I	I	WII
D.E.M preferably at 1:250,000 scale		I	I	WII
Soils, typography,		I	I	
Environmentally friendly infrastructure (buildings)			I	PRMVS
Ecological, portable offices			I	PRMVS

Land use	Manages	Uses	Needs	Comments
Planning	II	III	II	
Forest management / Wildlife management	I	II	II	
Ecodevelopment		I	I	
Local	I	I	I	
Boundary Issues	I	I	I	
Landscape management	I	I	I	
Conversion of Natural Landscapes	I	I	I	

ECOSYSTEMS	MANAGES	USES	NEEDS	COMMENTS
Forest types / cover		I	I	
Wetlands		I	I	
General Information		I	I	
Ecosystem Management	I	I	I	
Conservation of tropical ecosystems	I	I	I	
Projections of degradation of ecosystems	I	I	I	
Global climatic changes and their consequences	I	I	I	

Social/economic/political	Manages	Uses	Needs	Comments
Collaborative management		I		
ICDP's/stewardship/participatory programmes		I		
Demographic attribute data		I	I	
Livestock attribute data		I	I	
General Information		I	I	
Loss of Indigenous knowledge	I	I	I	
Development of indices from 1960 until 2000 and which parameters were used	I	I	I	
Development and implementation of new economic ecological indicators	I	I	I	
Natural resource economics	I	I	I	

Species	Manages	Uses	Needs	Comments
Distribution and Ecology of: Tiger, Lion, Elephant, Snow Leopard, Mountain ungulates, Crocodiles, Otter.		I	I	WII
General Information		I		
Management	I	I	I	
Conservation status on neotropical wildlife species	I	I	I	
Ecology and wildlife management of neotropical wildlife species	I	I	I	
Consumptive use and other kinds of neotropical wildlife species	I	I		

International agreements and programmes	Manages	Uses	Needs	Comments
CBD	I	II	I	
CSD		I		
Agenda 21		I		
JOMTIEN/NADI etc		I		
B.D.C		I	I	
World Heritage Natural Site		I		
CMS		I		
Ramsar	I	II	I	
Trade monitoring (CITES)	I	II	II	

4.2 Please indicate the geographic coverage of your dataset.

	Number	Comments
Local	IIIII	
National	IIIII	
Regional	IIIIII	
Sub-regional	IIII	
International	IIII	

4.3 Level of data holding (primarily held by individual staff within your institution of by the institution itself).

	Number	Comments
Mainly by individual staff	II	
Mainly by the institution	IIIIIII	

5 Institutional expertise

Number of staff within institution with expertise in information management.

Expertise	Enough staff	Need staff	Comments
Quality management	I	III	
Data collection/monitoring	III	III	
Data entry/quality assurance	II	III	
Data analysis	III	II	
Technical writing	III	III	
Graphic design/publishing	II	III	
Communication/marketing	II	III	
Networking	I	III	
Management information systems	I	III	
Geographic information systems	III	III	
Database development	II	III	
Systems management	I	III	
Local area networks	I	III	
Internet access/web-site	II	III	

6 Institutional facilities

6.1 Facilities owned or accessible by institutions in support of your teaching programmes

Communication

	YES	NO	COMMENTS
Telephone	IIIIII		
Fax	IIIIII		
Email accounts	IIIII	II	
Internet access points	IIIII	II	

Computers

	YES	NO	TOTAL	COMMENTS
IBM-PC 386 or lower	IIII	II	20(Garoua), 43(WII), 5 (PRMVS), 4 (Mweka)	
IBM-PC 486 or higher	IIIIII	I	8 (ICPL),1(Garoua) 14 (Córdoba), 92 (WII), 6 (Colorado), 25(PRMVS)	
UNIX workstation	I	IIIII	2(WII), 1 (Colorado)	
Macintosh	I	IIIII	1(WII)	
Pentium	I		10 (PRMVS)	

Operating systems

	YES	NO	COMMENTS
DOS	IIIIII	I	
Windows 3.1/3.11/95/NT/98	IIIIIII		
UNIX/Linx	II	IIIII	
Macintosh	I	IIIIII	
Local Area Network	III	IIII	
Other			

Geographic information systems

	YES	NO	COMMENTS
PC-ARC/INFO	IIII	II	
ArcView	IIII	II	
MapInfo	I	IIIII	
Other	III		WII has IDRISI for windows, GRASS, ERDAS-IMAGINE, S-Plus Córdoba has CAMRIS, PRMVS has IDRISI

Database management systems

	YES	NO	COMMENTS
XBASE	IIII	II	
Access	IIII	II	
Oracle	II	III	
Other (please specify)			

Related software:

	YES	NO	COMMENTS
Image processing	IIII	II	
Statistical/modelling	IIII	II	
Desktop publishing	IIIII	II	
Graphics/presentation	IIIIII	I	

Data input/output:

	YES	TOTAL	COMMENTS
Digitising tables	IIII	3 (WII), 6 (Córdoba), 1(Colorado), 2 (PRMVS)	
Scanners	IIIII	2(ICPL), 2(WII), 1 (Córdoba), 2 (Colorado), 3 (PRMVS)	
Plotters	II	3(WII), 1 (Colorado), 2 (PRMVS), some (Mweka)	
Colour printers	IIIII	2 (ICPL), 4 (WII), 4 (Córdoba), serveral (Colorado), 3 (PRMVS), some (Mweka)	
Other			
Film Recorder	I	1(WII)	
RGB Video projector	I	1 (WII)	
LCD Projector	I	1 (WII)	
B&W printers	I	5 (Garoua)	
Laser printers	I	3 (PRMVS)	

Field survey

	YES	TOTAL	COMMENTS
Vehicles	IIII	10 (Garoua), 4 (WII), 5(PRMVS), 12 (Mweka)	
GPS	IIII	2 (WII), 2 (Córdoba), 4+ (Colorado), 1 (PRMVS)	
Laptop computers	II	9 (WII), 4+(Colorado)	

Others

	YES	TOTAL	COMMENTS
Photocopier	IIIIIII	3(Garoua), ?(ICPL), 8 (WII), 1 (Córdoba), 2 (Colorado), 2 (PRMVS), 1 (Mweka)	
In-house printing	III	5(Garoua), 1 (WII), 1 (Mweka)	
Other			
Spiral binder	I	2 (WII)	
Laminating Machine	I	1 (WII)	

6.2 Availability of adequate information management facilities?

YES	NO	SOME	COMMENTS
III		I	Córdoba has limited facitlities
		I	Cameroon is starting to use computers
	I		Mweka
		I	PRMVS has adequate equipment and teaching in GIS applications, but is weak in training the resular use of databases

Specific facilities needed by organisations?

FACILITY	NEEDED BY	COMMENTS
E-mail	1 (Cameroon)	
Computers and network	1 (Mweka)	
Update of computers and library	1 (PRMVS)	

7 – Information products

7.1. Type of information product held or accessible by institutions

Hardcopy

	YES	NO	COMMENTS
Books/reports	IIIIII		
Forms/notes/tables	IIIIII		
Pictures	IIIIII		
Photographs	IIIIII		
Maps	IIIIII		
Spreadsheet	IIIIII	I	

Electronic files

	YES	NO	COMMENTS
Word processor files	IIIIII		
Database	IIIIII		
Video/film/CDrom	IIIIII		Cameroon has only Video/film

Digital data

	YES	NO	COMMENTS
Maps	IIII	III	
GIS coverage	IIIII	II	
Other digital data Remote Sensing SAT images Grey literature reports and other information	 I (WII) I(Colorado) I (PRMVS)		

Library facilities

	YES	NO	COMMENTS
Library facilities available	IIIIIII		
Effectively used	IIIIIII		
Not effectively used			

Information product that institutions would like to develop most.

PRODUCT	COMMENTS
Video/film/Cdrom	Garoua
Word processor files	Garoua
Database	Garoua
GIS coverage	Garoua
Generate own data through research	WII
State Forest Departments	WII
Forest Survey of India	WII
National Remote Sensing Agency (NRSA)	WII
National Informatics Centre (NIC)	WII
Survey of India (SOI)	WII
Indira Ghandhi Conservation Monitoring Centre (IGCMC)	WII
Digital Chart of the World (DCW)	WII
Implementation strategies	Colorado
Field applications	Colorado
Electronic and digital	Mweka
Updated home page	PRMVS

8 Networking/Partnership/Data access

8.1 Type and number of organisations providing data or information to training institutions.

Source Of Information	**Number**	**Comments**
National/Internationl NGO's	III	
Government departments	II	
Research institutions	II	
UNESCO	I	
IUCN	II	
Individuals		
WWF	I	
USFWS	I	
BID	I	
MINAE	I	
RAMSAR	I	
Rainforest Alliance	I	
None	I	

Institutions to whom institution regularly provide data to.

Institution	**Number**	**Comment**
None	I	
WWF	III	
UNESCO	I	
MINAE	I	
USFWS	I	
Rainforest Alliance	I	
IUCN	II	
Ministry of Environment and Forests	I	WII
Indian Institute of Remote Sensing	I	
Digital Chart of the World	I	

8.3 Collaboration with other training institutions.

Insititution	Number	Comments
Universities	I	
Indira Ghandi National Forest Academy	I	
Indian Council for Forestry Research & Education	I	
Indian Institute of Remote Sensing	I	
National Remote sensing agency	I	WII
Lal Bahadur Sastri National Academy of Administration	I	
Government of Córdoba	I	
National Parks Administration	I	Córdoba
US Park Service	I	Colorado
US forest service	I	Colorado
Wisconsin & Massachusets Universities	I	PRMVS
MINAE	I	

8.4 Access of data

Users

	Number	Comments
Unrestricted	IIII	
Restricted to some	IIII	
Restricted to most		
Unavailable for external use		

Accessibility

	Number	Comments
Free	III	
Free to most	IIII	
Free to some	I	
Charged	I	

Format of access

	Number	Comments
Hardcopy	IIIIII	
Floppy disk	IIII	
CD-ROM	I	
Email/Internet	III	
Magnetic tape DAT	I	
Private network		

8.5. The most important regional or international networks, steering groups or committees (relevant to biodiversity conservation) with which participating institutions are involved:

Network/steering group/committee	Coordinate	Facilitate	Participate	Support	Comment
GEF projects			I		
IUCN projects			II		
EUROPARC				I	
WCPA			I		
PA Management Training		I			
Biodiversity Assessment on ecosystem management	I		I		
World Bank				I	
TNC				I	
WWF				I	
USAID				I	
Inter-university committee on biological diversity		I	I		PRMVS
National group for the National Law of Biological Conservation		I	I		PRMVS
Informal/formal contact with INBIO		I	I		PRMVS
Latin American network for sustainability strategies		I	I		PRMVS

9– General comments: On the light of **"WCMC Handbooks on Biodiversity Information Management"**.

Topic	Currently Covered	Priority Rank For Further Development	Major Areas To Develop Most	Comments
Information and policy	Yes	3,3,1	DMP Development / Conservation Case studies	WII Córdoba don't have it and consider it not important
Information needs analysis	Yes No	3,1 1	Information need analysis for biodiversity conservation. Inter Dept./ Agencies/ Corporations	WII
Information product design	Yes No	2 1,3	On electronic format for information dissemination	WII Córdoba don't have it but consider it important to develop it. PRMVS don't have it and would like to develop this in the form of a home page.
Information Networks	Yes No	2 1,3	Operation of multi partner team	WII Córdoba don't have it but consider it important to develop it. PRMVS doesn't have this but it would like to develop a network of alumni.
Data Custodianship and Access	Yes No	2,2 1	Security to data safety	WII Córdoba don't have it but consider it to be very inportant to develop it. PRMVS has this but needs trained staff and updated equipment.
Information management Capacity	II No	3,3,2 1	Scale Conversion	WII and Córdoba consider this to be very important PRMVS needs to raise its expertise in all human resources - training staff
Data Management Fundamentals	Yes No	2 2,3		WII PRMVS need trained staff

10 General comments on the initiative

10.1 Suggested main goals of the initiative

Goal	Comments
Develop technical expertise of wildlife managers in gathering, storing and presenting data	
To integrate biodiversity info management into the curricula of Wildlife Training Institutions	
Develop capability for dissemination of information on Pas management & biodiversity conservation planning in India, South and South East Asia.	
Develop and organise available information on the Southern region of South America	
Provide useful, easy to use tools for research and management	
Data fundamentals and management	
To integrate biodiversity information management into curricula, to provide insight in how to do so and how to make this a reality in practical terms.	
Enhanced wildlife/ Protected area management	

Principal Objectives	Comments
For institutions and managers to gain a deeper understanding of the technical potential and shortcomings of data management	
To provide training in approaches to data gathering, management and presentation, based on universal principals, whilst ensuring local flexibility	
To induct biodiversity information management into WII's course curricula	
Promote development of database information on all aspects related with wildlife management within the region	
Develop infrastructure and procedures for making this information readily available	
Train wildlife managers in the use of this information	
Common format for data	
Data management protocols	
Relation to field application	
Gather store and retrieve information	
Build database	
Develop information networks	
To be updated in what is going on with biodiversity information and its relationship with curricula around the world	
To get a rough idea of PRMVS bench-marketing (in comparison with other programmes and our competitive level)	

10.3 Major roles of institutions

Major Role	Comments
Teaching and training	WII, Córdoba, ICPL
Participate in the network	Garoua
Host seminars and workshops	Garoua
To incorporate new techniques in curriculum and develop more external relations	Garoua
To offer BIODOC as a custodian of biodiversity information in Latin America	PRMVS
Regional centre	Mweka
Acquisition and storage of data	WII & Córdoba
Dissemination of info through Hard Copy, Electronic Media, Consultancy to user group in info management	WII
Specific research projects	Córdoba
GIS training	Colorado
Remote sensing training	
Field application methodology	

10.4 Key aspects that are missing from the proposal or would like more developed.

Aspect	Comments
Following up graduates in institutions	Garoua
Distinguishing between technical competencies required to gather and manage data, and other competencies required to ask the right questions, to analyse biological data in context of other information and make decisions in light of other considerations.	ICPL
Original proposal covers almost all aspects of BIM	WII
Mechanism to promote easy access of the available information	Córdoba
Funding	Córdoba

3. CONCEPTS AND PRINCIPLES IN INFORMATION MANAGEMENT

Establishing Information Needs and Designing Information Products for Decision Makers

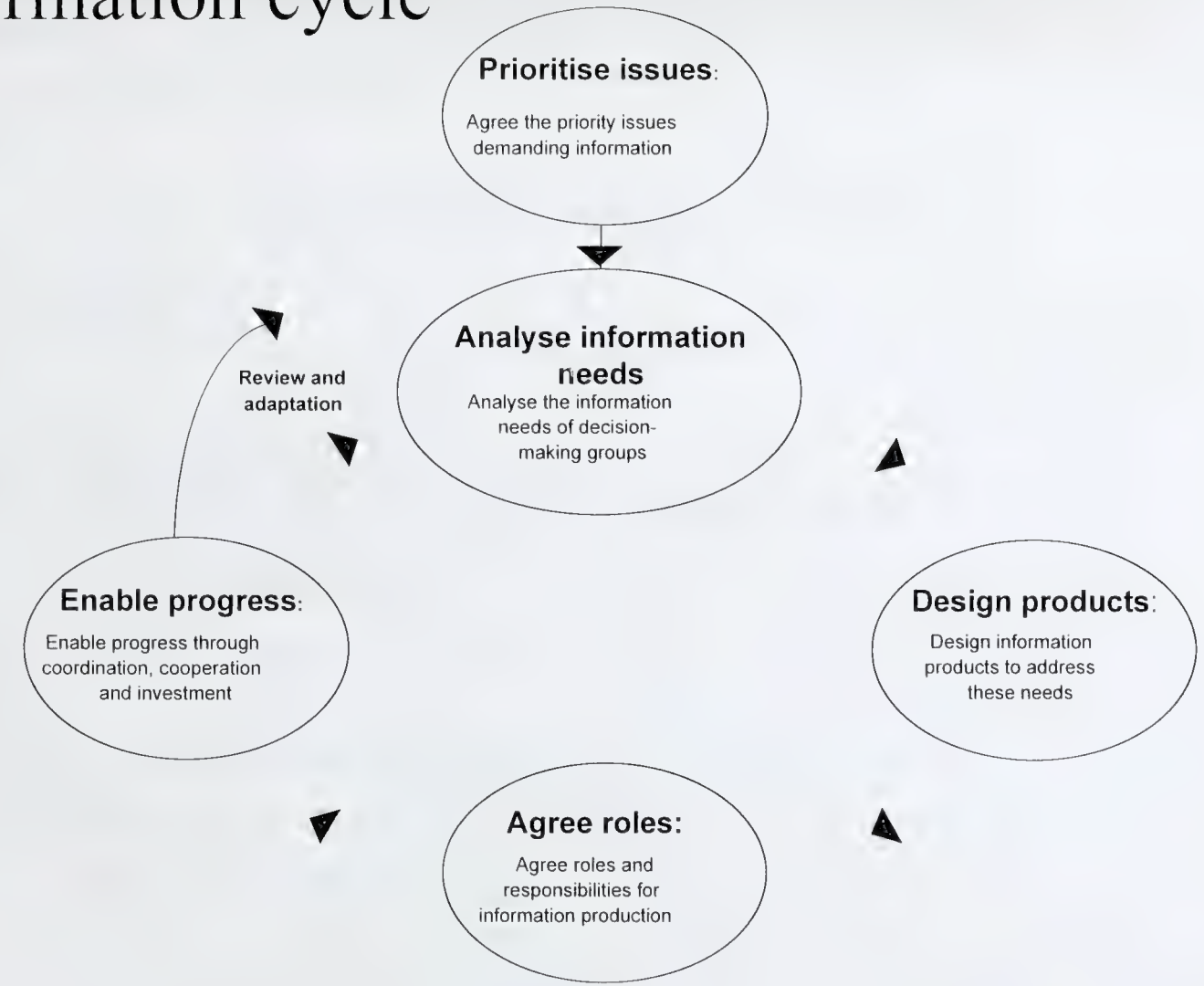
Kent Cassels

Training and Education Co-ordinator
World Conservation Monitoring Centre

What is it?

- Constructive dialogue between information providers and users
- Determines what information is necessary to help users achieve their goals (i.e. address issues)
- Leads to a consistent, mutually-agreed set of information objectives
- The basis for information product design

The information cycle


Prioritise issues:
Agree the priority issues demanding information
Analyse information needs
Analyse the information needs of decision-making groups
Design products:
Design information products to address these needs
Agree roles:
Agree roles and responsibilities for information production
Enable progress:
Enable progress through coordination, cooperation and investment
Review and adaptation

Determining data needs

- Which 'datasets' underpin the information needs?
- Who manages these currently?
- Can they be accessed easily?
- Is their quality sufficient for the intended use?
- What are the priorities for data collection conversion (a gap is not a gap…?)
- Are international data sources needed?

Why is the analysis necessary?

Improves cost-effectiveness

- the earlier that needs are identified, the easier and cheaper they are addressed

Improves efficiency

- the needs of different groups often overlap

Promotes partnership

- between information providers and users

The process
a series of basic questions...

Policy analysis

- what issue is being addressed?
- who are the stakeholders/interested parties?
- what are their goals with respect to the issue?
- how do they currently use environmental information?
- what are their constraints?
- what legal and regulatory framework exists?
- what is the historic progression of policies?

Policy support

- what information do stakeholders need to agree a solution to the issue?
- how, when and to whom should the information be delivered?
- how will performance be measured?

Aims:

- to define issues, clarify goals, achieve consensus
- to understand decision-making processes
- to reveal information needs more clearly

Different methods may be used depending on:

- the scope of the analysis
- its technical complexity
- the extent of participation
- the available resources

Information gathering

- questionnaires
- interviews
- brainstorming
- literature search (e.g. 'grey' literature)

Analysis

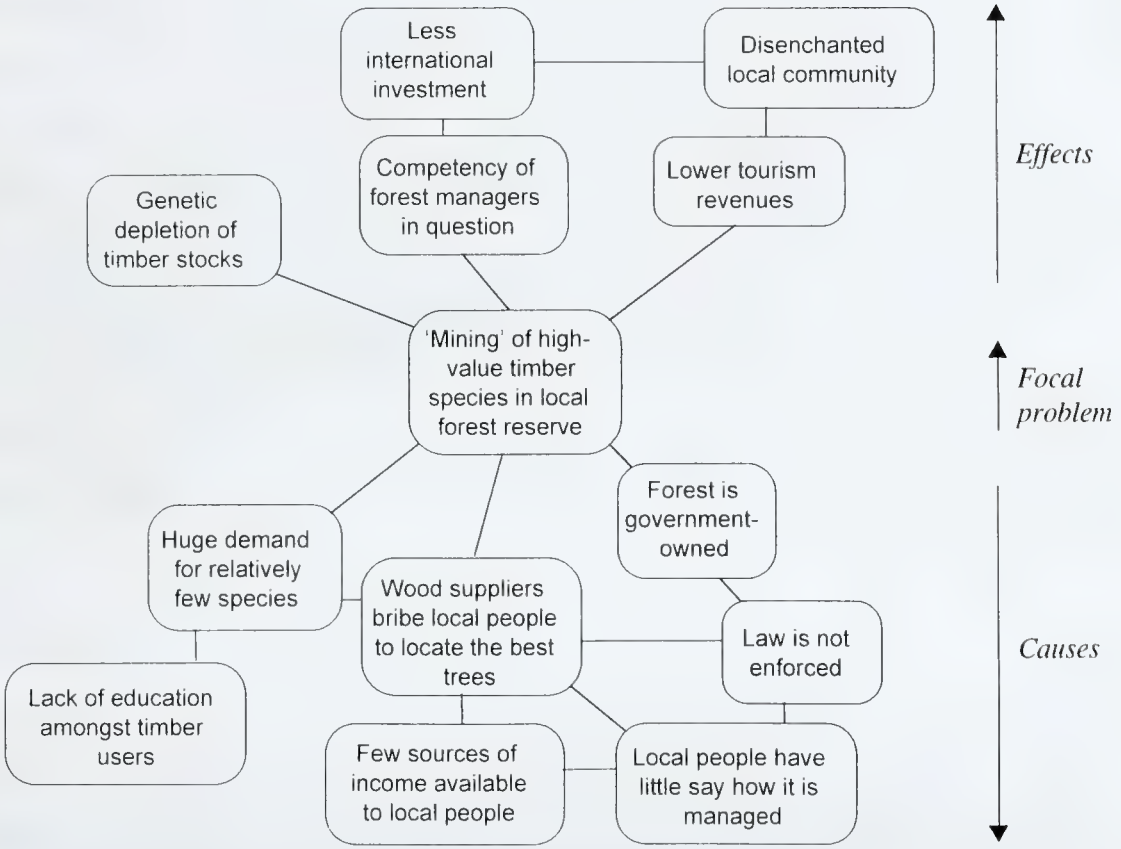
- stakeholder analysis
- problem tree analysis

- **Consensus building/forward planning**
- visioning exercises
- workshops
- working groups

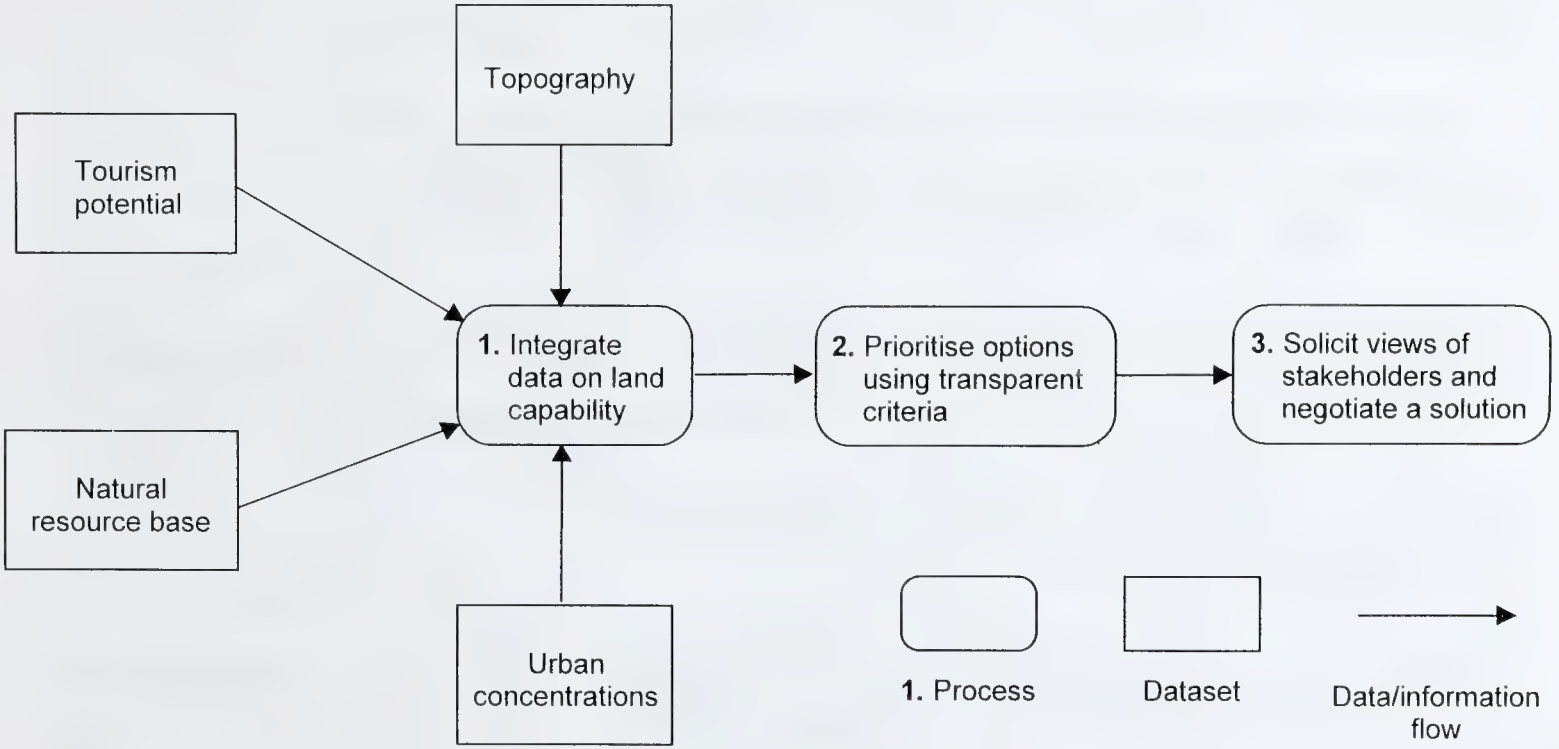
Consolidation

- process modelling

Problem tree analysis


Less international investment
Disenchanted local community
Competency of forest managers in question
Lower tourism revenues
Genetic depletion of timber stocks
'Mining' of high-value timber species in local forest reserve
Forest is government-owned
Huge demand for relatively few species
Wood suppliers bribe local people to locate the best trees
Law is not enforced
Lack of education amongst timber users
Few sources of income available to local people
Local people have little say how it is managed
Effects
Focal problem
Causes

Data-flow diagram (process model) for land-use planning



Global Forest Information Service (GFIS) Policy Framework

Guiding objective

To contribute to the management, conservation and sustainable development of forests and to provide for their multiple and complementary uses

Relevant Forest Principles

- Principle 2 (c): The provision of timely, reliable and accurate information on forests and forest ecosystems is essential for public understanding.
- Principle 3 (b): International institutional arrangements, building on those organisations and mechanisms already in existence, as appropriate, should facilitate international cooperation in the field of forests.
- Principle 12 (c): International exchange of information on the results of forest and forest management research and development should be enhanced and broadened as appropriate, making full use of education and training institutions, including those in the private sector.

Major information needs

- Historic and current national forests policy, plans, legislation and management structure, including degree of participation in decision-making.
- Existence of fiscal, trade, industrial, transportation and other national policies that may lead to forests degradation (so-called 'perverse' policies).
- Distribution, extent, type (e.g. natural/plantation), quality and trends (e.g. deforestation/reforestation) in forest assets.
- Various uses of forest goods and services within different counties, for example in pie chart form (e.g. wood and wood products, food , fodder, medicine, other NTFPs, household and industrial energy supply, recreation, biodiversity conservation , carbon sinks and watershed/water resources protection).
- Relative economic and non-economic values of forest goods and services in different countries.
- Relative international investment and technical cooperation in forest management, conservation and sustainable development, primarily in developing countries.
- Relative financial resources and institutional capacity for forest management, conservation and sustainable development; external indebtedness; key capacity needs (skills/know-how, technologies, information).

- Existence of national guidelines (codes of practice) for sustainable forest management and for environmental impact assessment, and estimate of government/industry/community compliance; application of incentives/penalties to achieve compliance.
- Relative protection afforded to forests, including key or unique ecosystems such as primary/old-growth forests, cultural, spiritual, historical, religious and other unique or valued forests of national importance.
- Country-by-country problems that hinder conservation and sustainable use of forests, for example air pollution, agricultural expansion, market demands, international demands and lack of options for urban and rural poor, and their relative importance.
- Historic, current and required scientific research in forest management, conservation and sustainable use in different countries.
- Relative levels of indigenous capacity and knowledge which can be applied to forest management, conservation and sustainable use.
- Relative levels and types of trade in forest goods, including key products, destinations, amounts, worth, and the policy and legal framework under which they are traded.
- Relative tariffs/duties and other impediments to export/import of forest goods and technologies.

Information Product Design

What is an information product?

Information which:

- helps users achieve policy and management goals
- clarifies otherwise difficult decisions
- bridges the scientific research & policy-making gap

Effective information products:

- are aimed at a specific user & for a specific purpose
- are relevant to decision-making needs
- are available when the need arises (timely)
- are easily and quickly understood
- are delivered through recognised channels

Effective information products:

- are based on sound scientific principles
- utilise high quality data
- identify areas of uncertainty and their significance
- acknowledge data sources & intellectual property
- are cost effective in time and money

Information products have a life cycle:

- monitoring and research activities
- managed data
- information
- information product

Upward transitions refine information content

Design 1: Definition

- Overview - Specification
- Content - 'Pressure-State-Response' model
- Complexity
- Structure and layout - Media options
- Timing
- Method of delivery

Overview: The design process

- Analyse information needs: what information is needed and who needs it?
- Define information products: content, complexity, timing, format, delivery method
- Analyse data needs
- Analyse processing needs
- Prepare *functional specification* for developers

Product specification

Created for product developers, and consists of:

- preamble discussing the purpose of the product
- definition of the content, complexity, timing, format and method of delivery of the product
- indicative budget and time-scale

Conceptual in nature

May also contain technical details as follows:

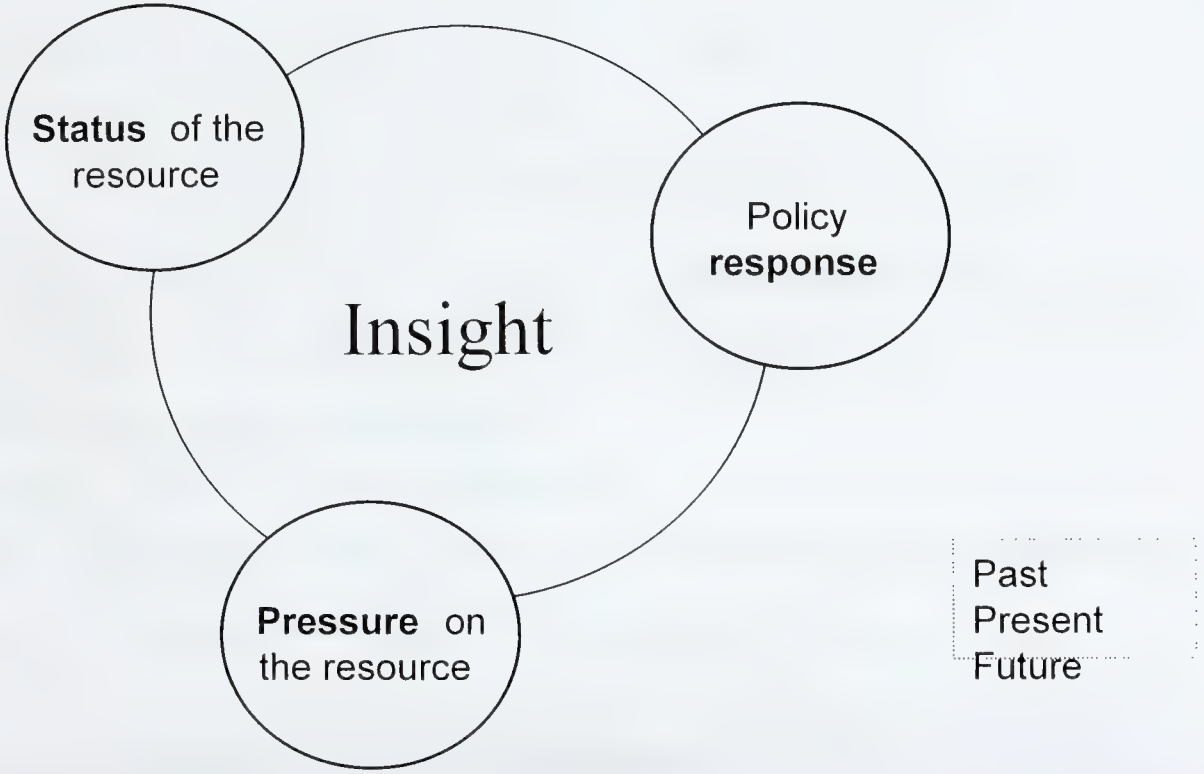
- analysis of data needs
- analysis of processing needs
- data models (e.g. E-R diagrams) depicting the relationships between key datasets

Good decisions on biological resources depend on access to three information topics:

- the status of the resource ('what is happening?')
- the pressures it faces ('why is it happening?')
- the current and historic policy responses ('what are we doing about it?')

Possession of this information enables stakeholders to balance economic, social and environmental goals

Policy-relevant information



Complexity

Scientific results are notoriously inaccessible

- Too complex; sheer volume; not policy focused

'Environmental Indicators'

- Single time-varying numbers (e.g. Dow, GDP)

Extraction of information from underlying data

- Abstraction
- Summary

Environmental data well suited to spatial summary - GIS

Design 2: Analysis

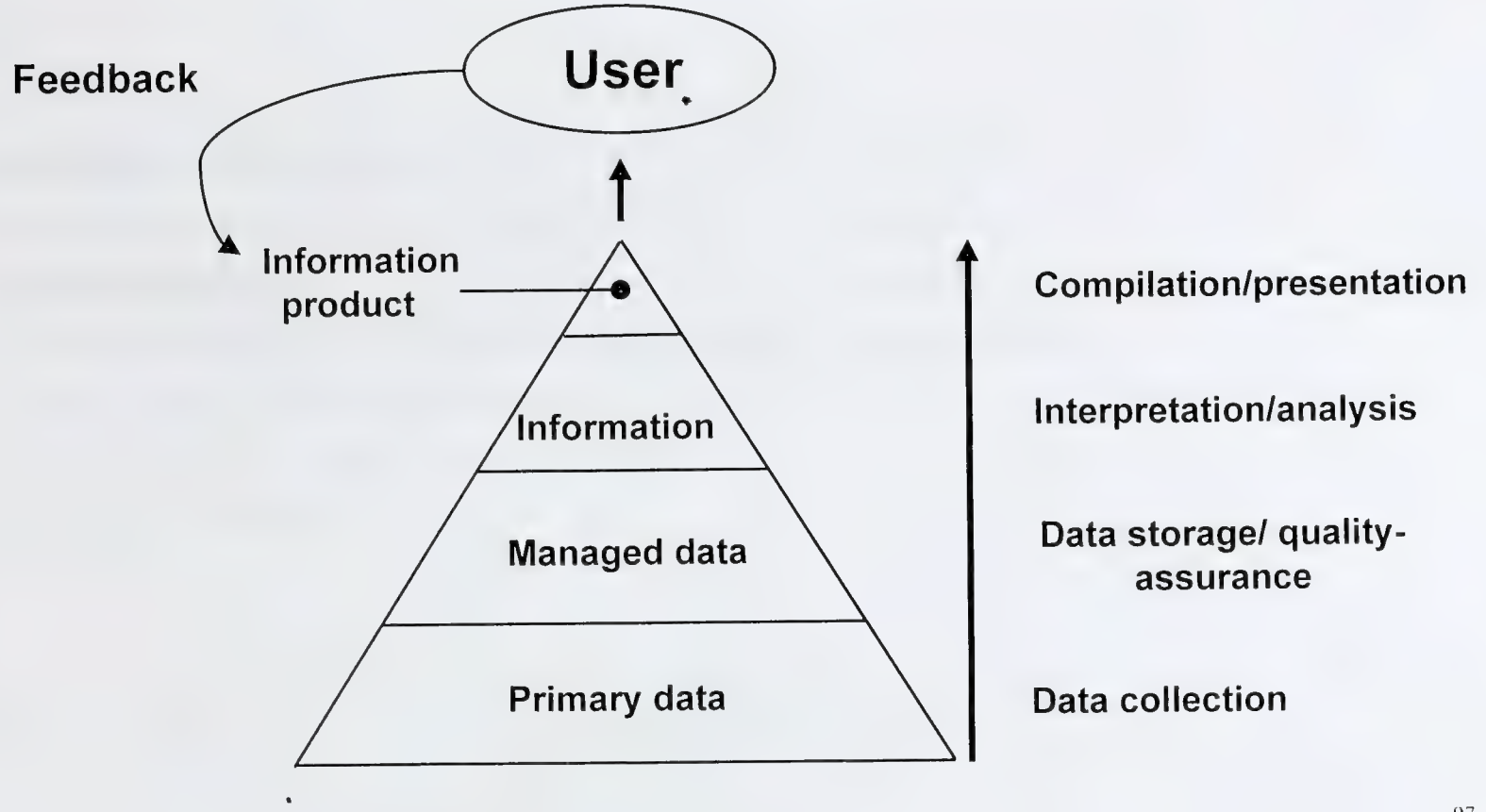
- Analysing data needs
- Analysing processing needs
- Data collection
- Data storage and quality assurance
- Interpretation and analysis
- Compilation and presentation

Analysing data needs

Data should be stored and quality-assured only ***once****, and made available many times for many purposes*

- The identification and management of *essential datasets* is an important early step for information managers
- They are in frequent, if not continuous demand
- Some datasets underpin the development of many information products

Information pyramid



Considerations include:

- who is leading the product's development?
- which other organisations are involved?
- are the necessary data, skills and facilities available?
- who is paying for it?
- how does it relate to other products?

Continuous improvement is the key

Information Product Questions

- Audience and Purpose?
- Relevancy?
- Timeliness?
- Understandable?
- Recognised source?
- Data basis?
- Uncertainties?
- Data sources?
- Cost-effectiveness?

Information Networking Custodianship and Access

Dr John Busby

Manager, Biodiversity Conservation Monitoring Systems

Why a network?

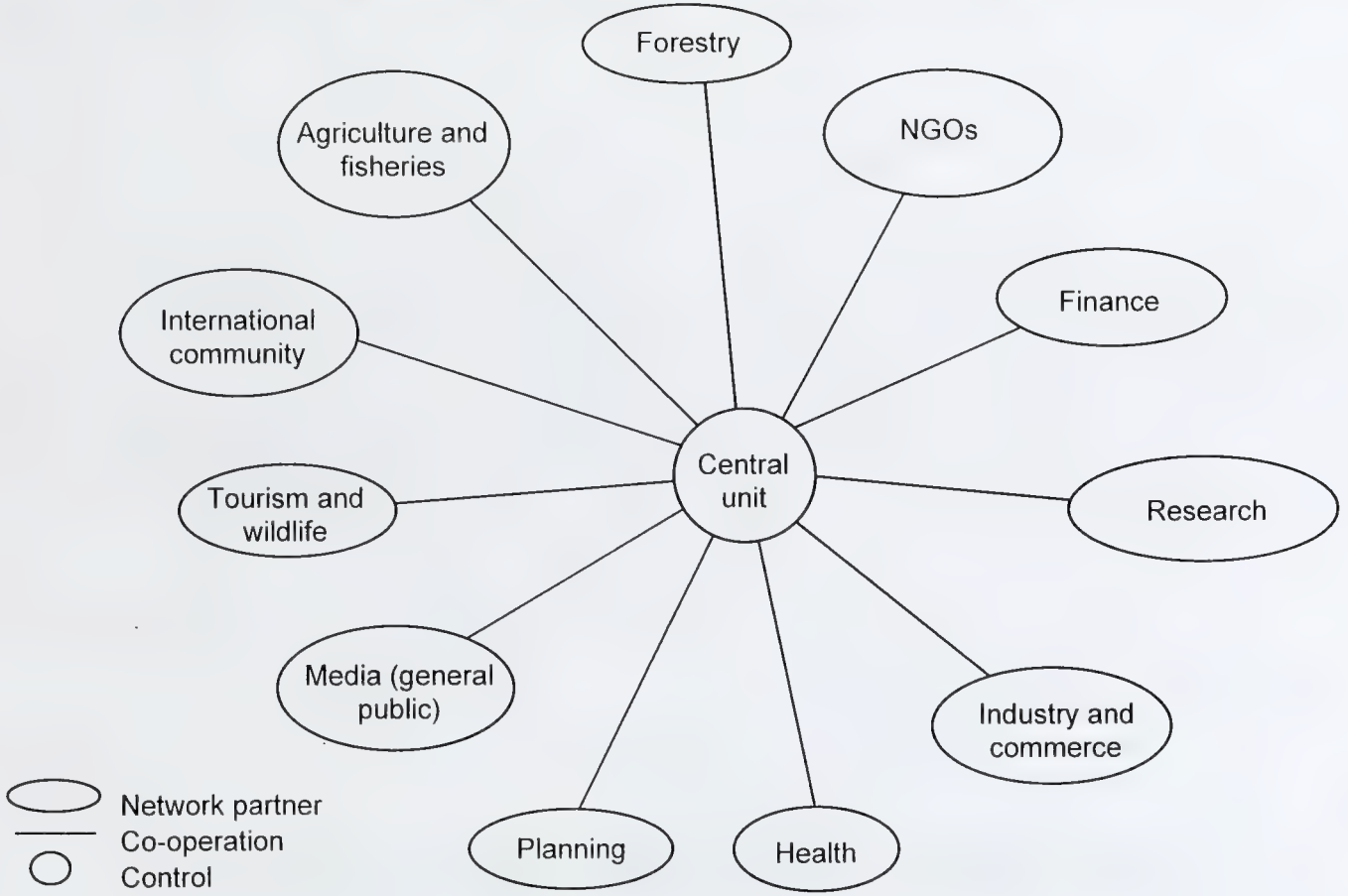
- multi-disciplinary nature of the information required to address environmental issues and concerns
- no one agency has 'all the answers'
- many stakeholder groups/interested parties involved
- demand for informed decision-making at various levels

Steering process

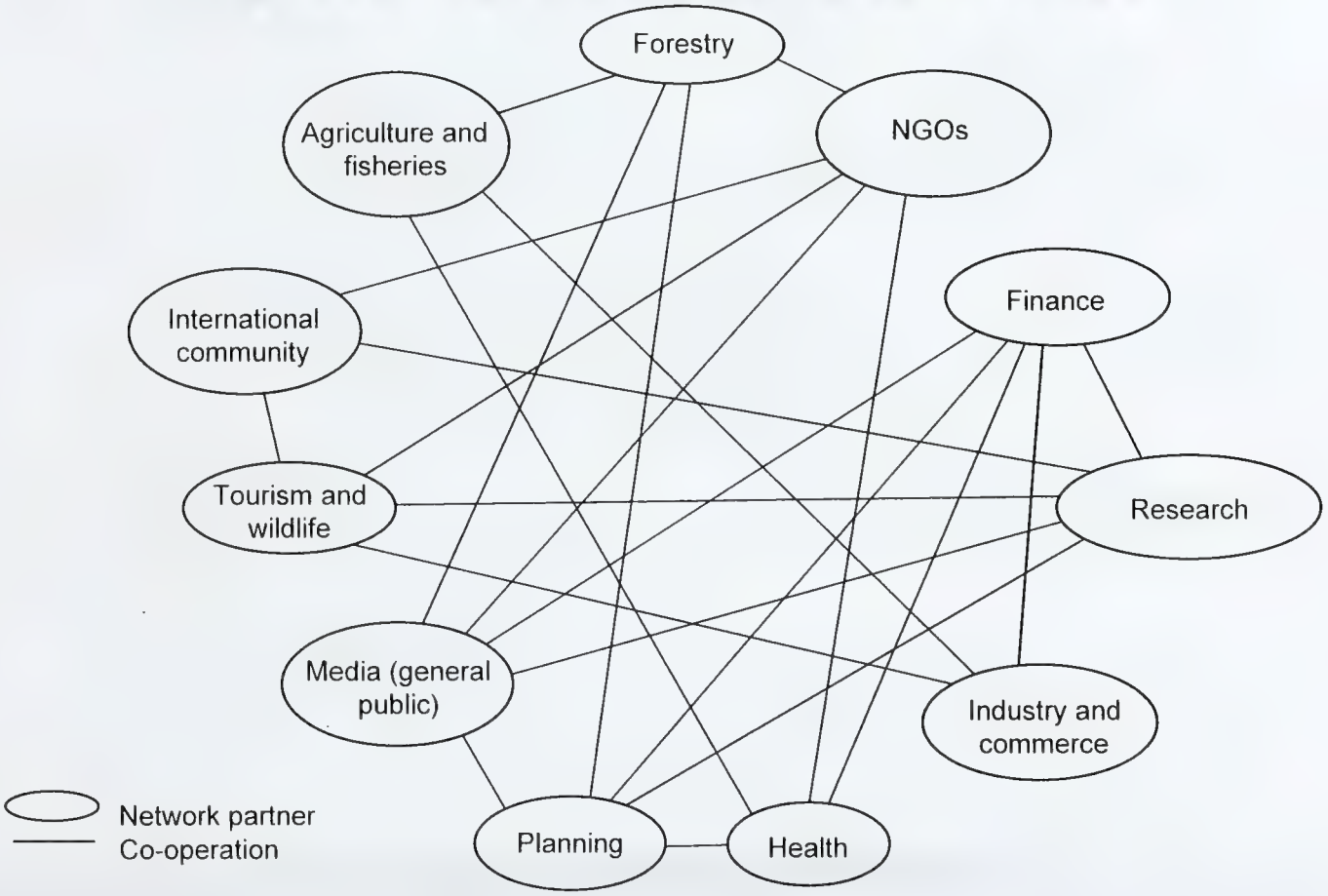
- senior-level representation from those involved in the network
- authority to commit network resources
- authority to commit or ability to influence commitment of member resources
- must ensure network is demand(user)-driven (by needs of decision- makers) rather than supply-driven (by members)

- Network architectures
- centralised
- fully distributed
- facilitated

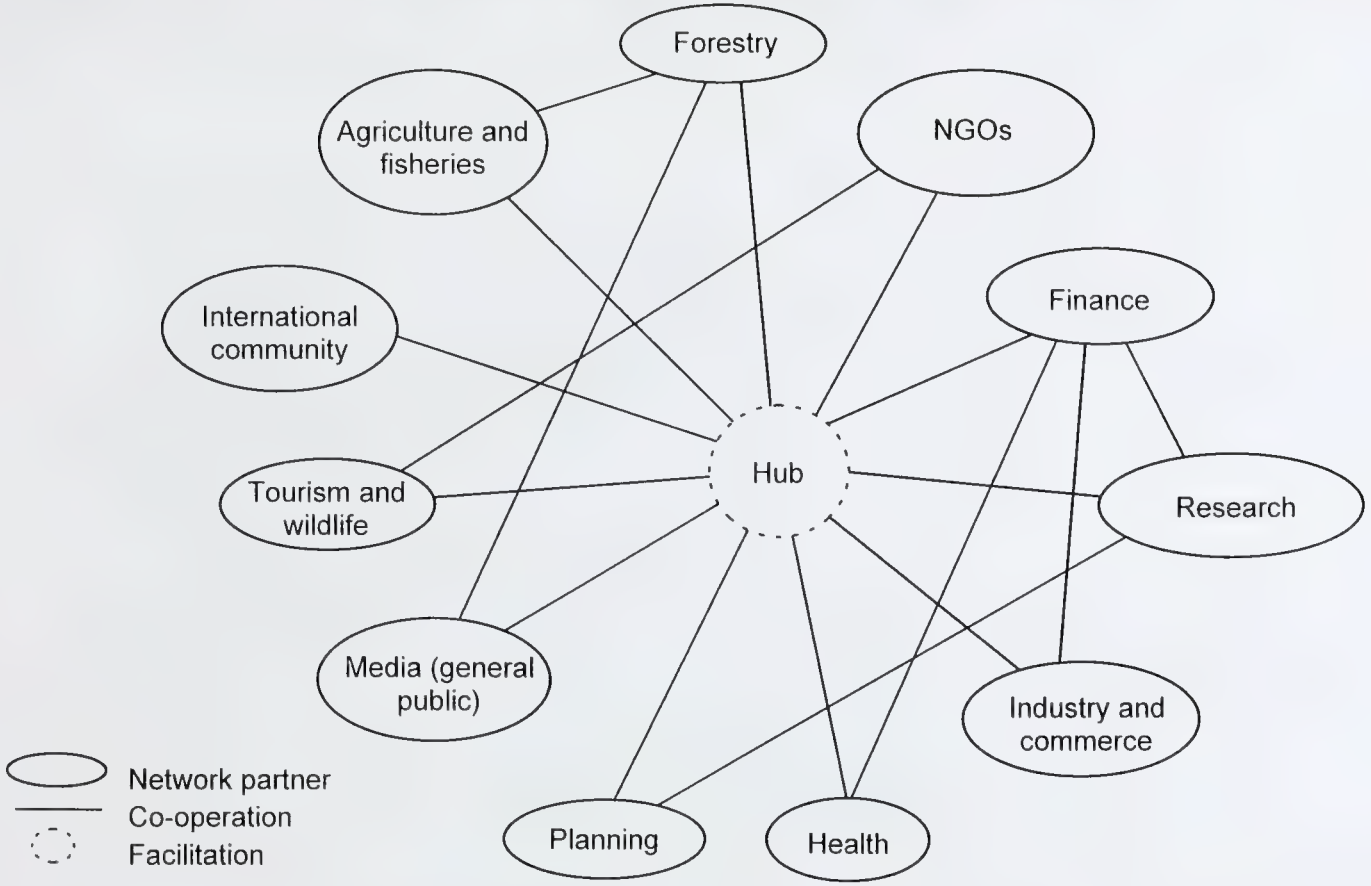
Centralised network



Fully-distributed network



Facilitated network



Organisation of the network

- operation of network
  - facilitated by a central hub
  - underpinned by custodians and standards
  - driven by partnership
- players
  - hub (with Steering Committee)
  - custodians
  - users

Role of the hub

- steering the network
  - promote co-operation amongst partners
  - facilitate access to data through active management of custodianship
  - facilitate development of the network
  - facilitate implementation of the information cycle (from needs analysis through to producing products and services)
- secretariat
  - organise meetings, workshops,..
  - prepare and distribute correspondence, newsletters,..
  - handle enquiries about network activities, referring to partners as appropriate
  - maintain copies of network products for distribution
  - manage data concerning network resources and activities (metadata)

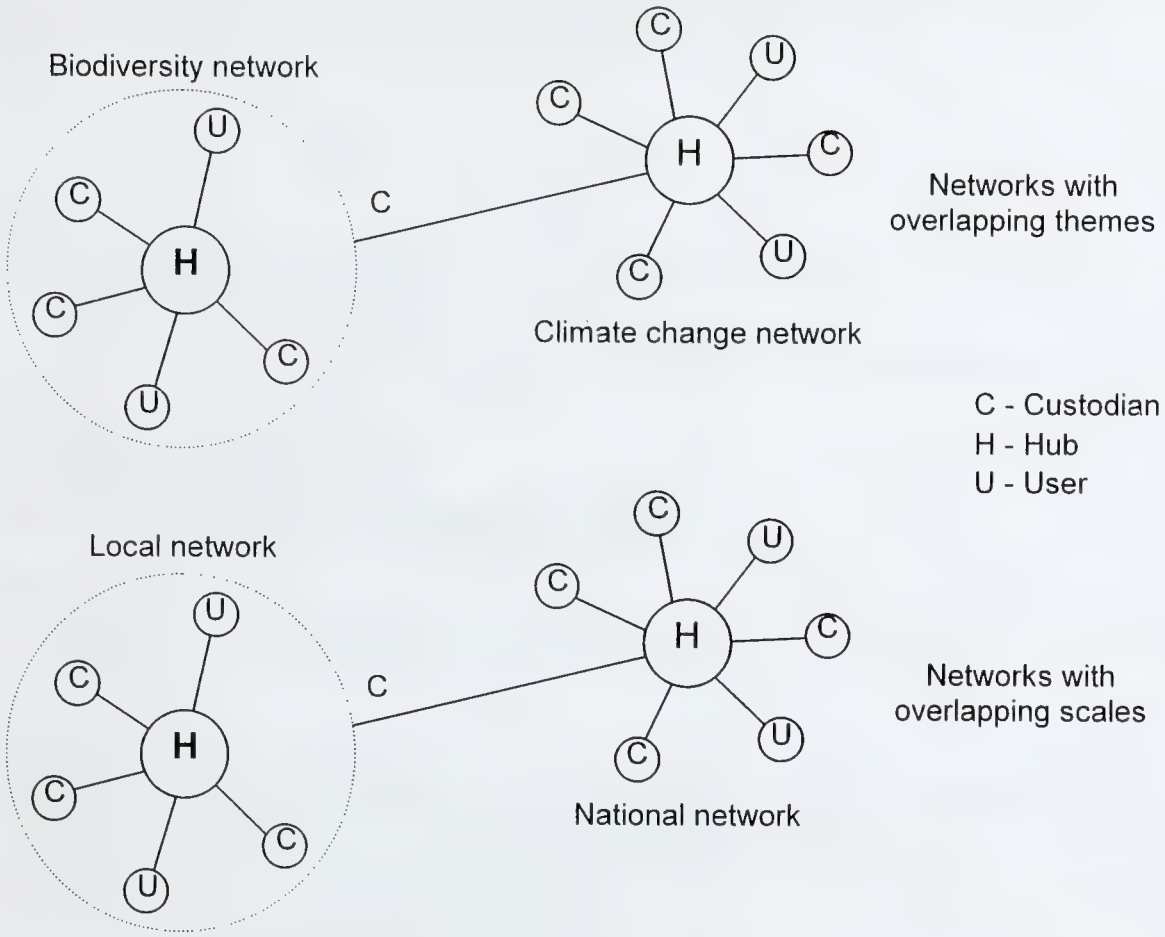
Operation of the network

- participatory, co-operative
- partners play multiple roles
- multi-participant teams
  - formed to undertake specific tasks
  - resources supplied by network members
  - overall direction from hub (steering process)
  - support from hub (secretariat)
  - results are network products and services

Sustainability of the network

- network must be flexible, evolutionary
- the purpose must be clearly identified and easily understood
- some visible successes at an early stage are important
- must have continued commitment at senior levels

Multiple roles in information networks



Data Custodianship & Access

Custodianship

- what is it?
  - the custodian of a dataset or other information resource is the agency or individual best able to manage it effectively
  - custodianship can work at many levels (e.g. local, national, international)

- Custodianship and ownership

Data custodians are not necessarily owners

- owners
  - retain (some) intellectual property rights even when they are not data managers
- custodians
  - manage data
  - may need to consult with owners on data management or data release issues and remit royalties

Custodians and users

- custodians
  - are data providers and (usually) data managers
- users
  - information users typically want 'value' added to data to support decision-making
  - expert users may require (primary) data for analysis and interpretation

- Importance of custodianship
- unless managed, data become inconsistent, unreliable, or obsolete
- custodianship makes management responsibility explicit, minimising:
  - duplication (or absence) of responsibility
  - difficulties in accessing data
- in principle, environmental data should be widely accessible in order to more-effectively support decisions

Responsibilities of custodians

- to co-ordinate the development of a dataset (perhaps in partnership)
- to maintain a dataset (e.g. update, backup)
- to ensure the quality of a dataset (e.g. adherence to standards, documentation [metadata], audit trail)
- to advise on appropriate uses of a dataset
- to provide access to a dataset

Rights of custodians

- to regulate access to a dataset (e.g. to prevent commercial exploitation or environmental risk)
- to safeguard intellectual property and copyright (e.g. acknowledgement by users, regulation of copying/ distribution)
- to receive feedback from users on data quality/ future requirements of a dataset (resource implications to be negotiated)

Responsibilities of users

- give feedback on perceived quality/reliability
- give feedback on requirements anticipated in the future
- observe standards set by the custodian
- keep custodian informed of usage, products generated

MOST IMPORTANTLY

- comply with provisions of data access agreement

Managing custodianship

- custodians need to be clearly identified and established
  - confirmation may be all that is required
  - selection criteria may be needed if several agencies see themselves as custodian of the same data
- custodians must understand and accept their role
- some form of monitoring & evaluation is needed

Choosing a custodian

- criteria could include
  - statutory responsibility
  - greatest operational need
  - first to record changes
  - most competent to capture and/or maintain data
  - best financial position
  - has the confidence of users

Concerns of custodians

- will the dataset be used correctly?
- is the exchange consistent with policy?
- will use of the dataset be fully acknowledged?
- could credibility suffer (e.g. where data are found to be of poor quality)?
- will costs be covered?
- is there any vulnerability to legal liability?

Concerns of users

- is the dataset fit for its intended purpose?
- will it be available on time?
- will onerous conditions be imposed?
- is it accessible in a standard format?
- what, if anything, will it cost?

Practical steps

- steering process
  - confirming/allocating custodianship
  - monitoring custodian performance
  - drafting a generic data access agreement for adaptation by custodians (intended to promote access to environmental data at minimum cost, with minimum restrictions)
- for custodians
  - document corporate datasets [metadata]
  - maintain datasets in readily accessible form
  - ensure data quality
  - develop data access agreements
  - operate in a spirit of trust
- for users
  - comply with data access agreements (e.g. acknowledge data sources)
  - provide feedback to custodians on future needs
  - provide copy of derived products (e.g. publications) to custodian
  - operate in spirit of trust

Access agreements

- access conditions for different classes of user (e.g. commercial, government, research, NGO...)
- details of any transaction costs
- permitted/ excluded uses
- how/ whether to distribute to third parties
- how to acknowledge
- a disclaimer (to protect from legal liability)

Transaction costs

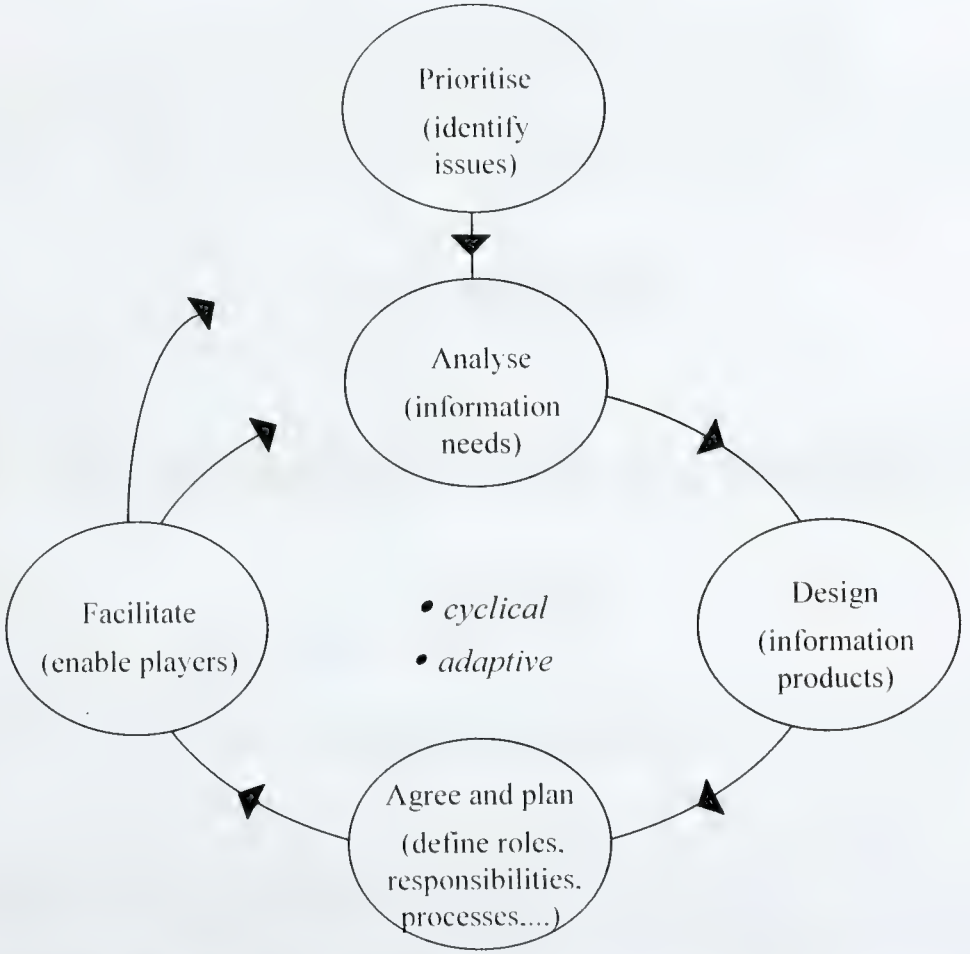
- to promote use, costs should be lowest sustainable amount
- various schemes possible:
  - totally free (i.e. subsidised to promote co-operation)
  - free to reciprocating users only (i.e. barter)
  - pay 'incremental cost of supply'
  - pay/contribute to original development costs
  - pay above cost (i.e. 'market value')
- different schemes can be applied to different classes of user

Building Institutional Capacity and Data Management Fundamentals

Javier Beltran

Regional Programme Officer, Latin America and Caribbean
World Conservation Monitoring Centre

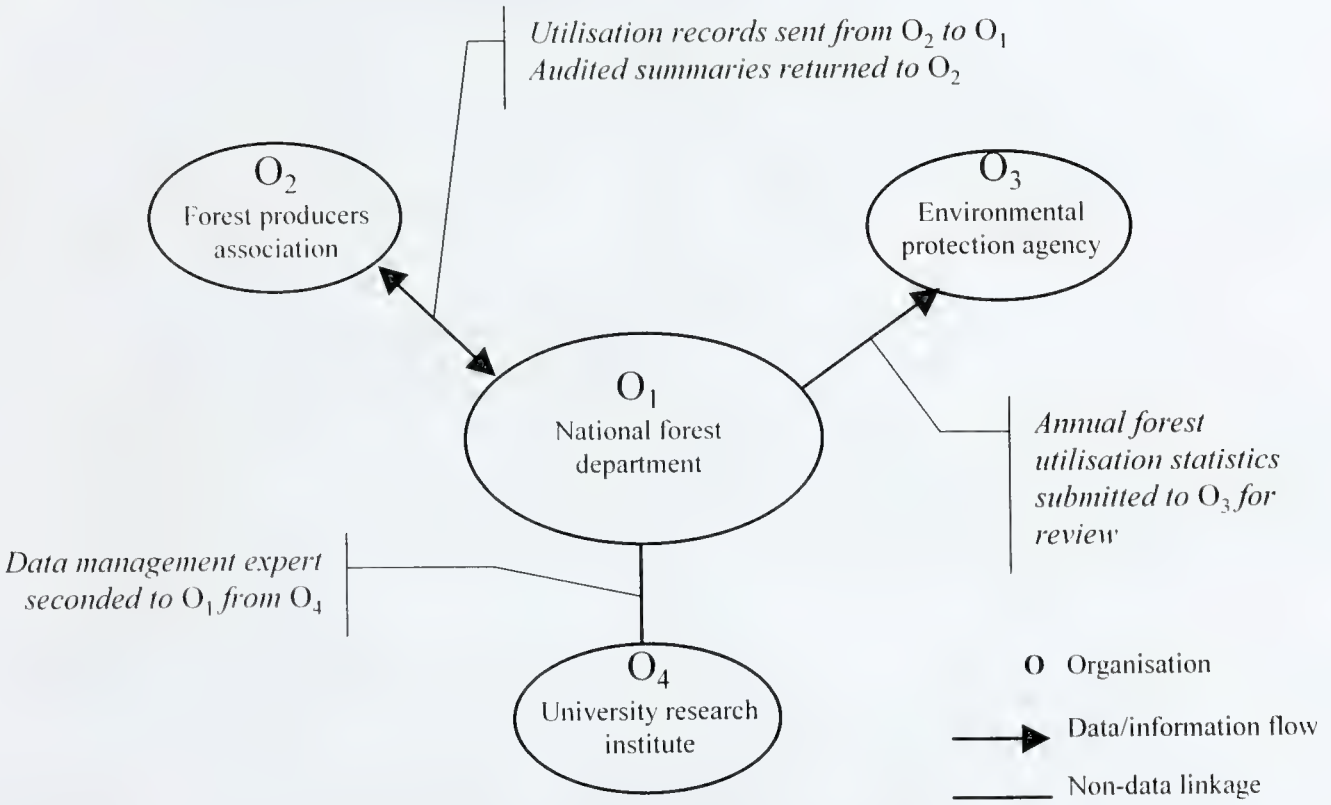
The information cycle



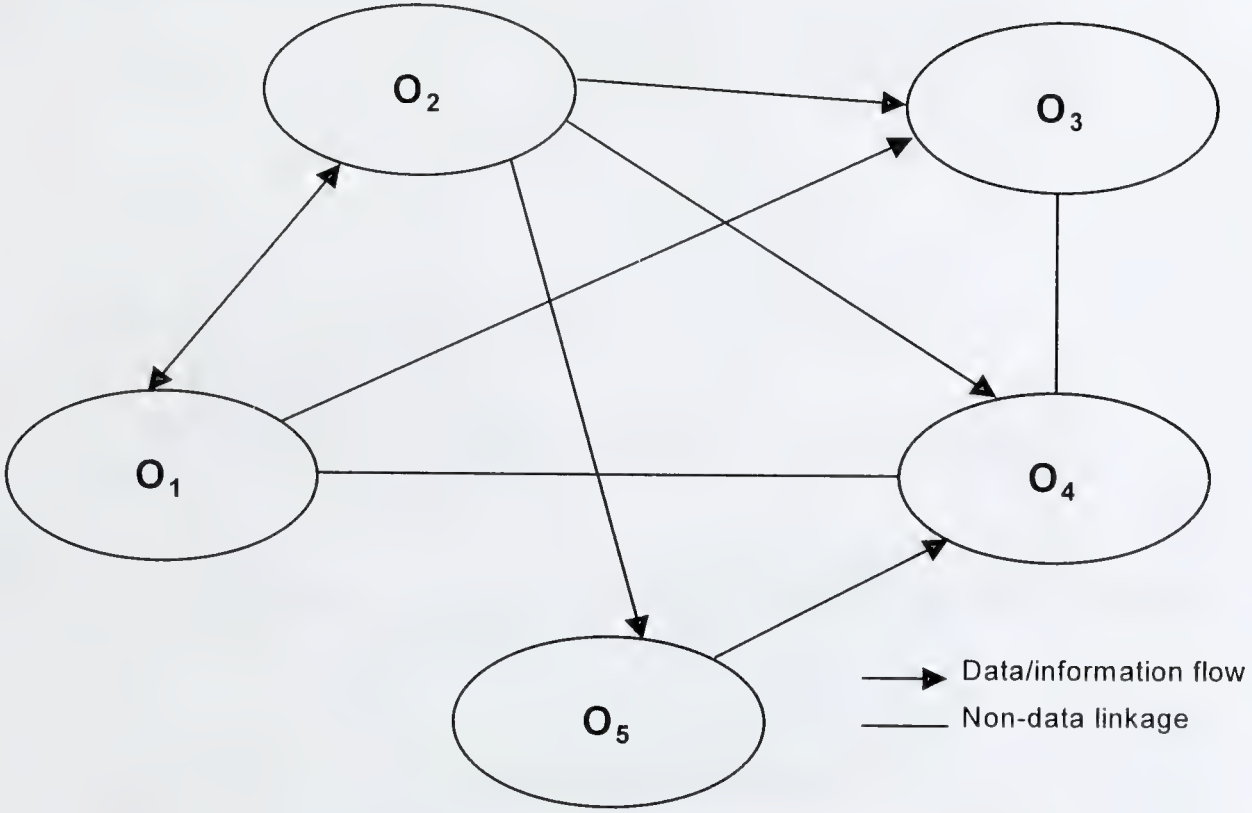
Assessment

- what to assess
  - data resources
  - facilities relating to information production (from data collection through to product packaging
  - human resources
  - management systems and procedures
  - institutional linkages/partnerships
- who to assess
  - network members,...others?
- How to assess
  - some form of institutional survey required
  - determines institutional roles, overlaps and linkages
  - reveals institutional capacities and needs
  - documents data availability and quality
  - builds consensus, trust and co-operation
- methodology almost certain to involve a questionnaire

Organisational Linkage Diagram



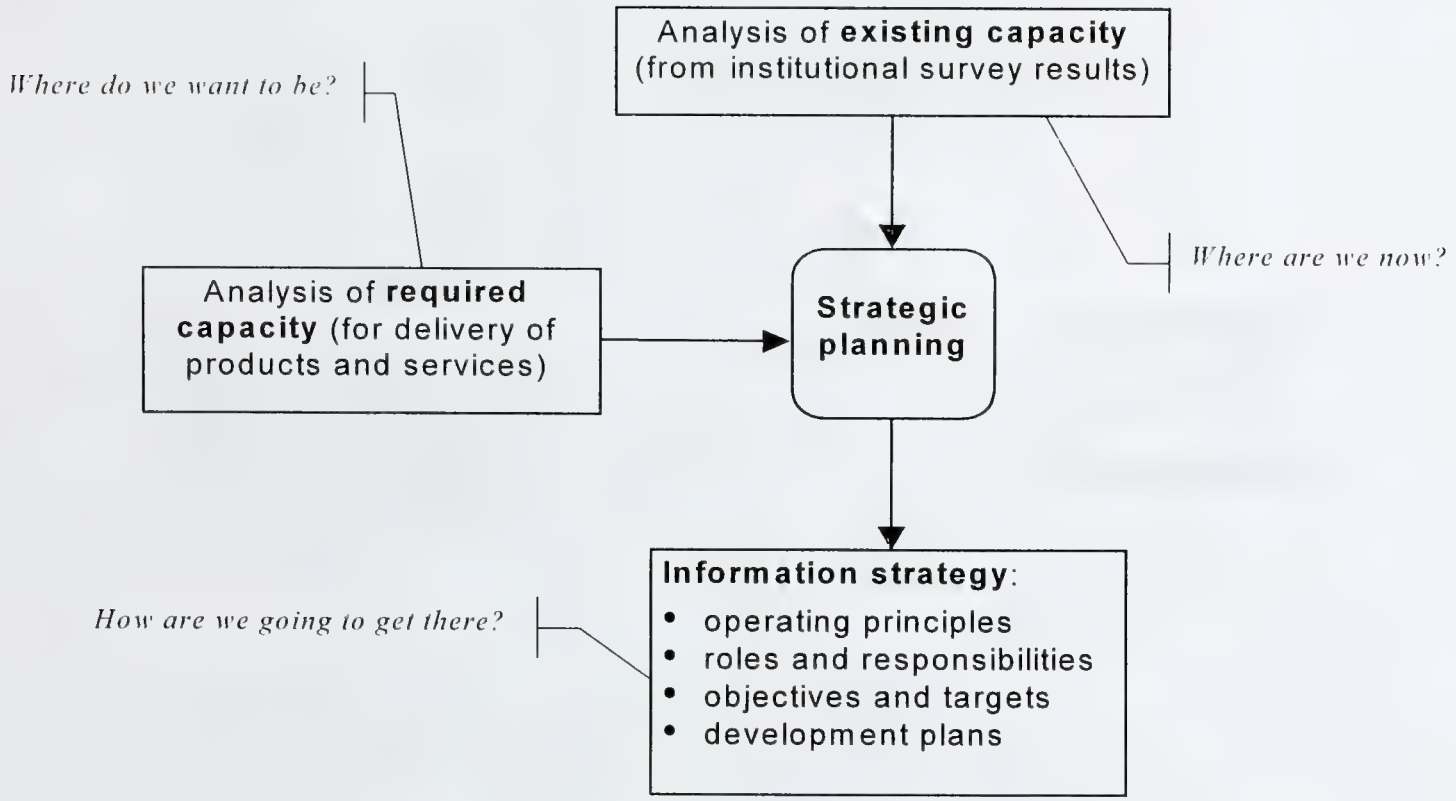
Composite Linkage



Planning capacity building

- match the existing capacities to those required (to deliver information products and services)
- identify deficiencies and duplications
- develop overall operational strategy and plan to build network capacity

The Strategic Planning Process


Analysis of **existing capacity** (from institutional survey results)
Where do we want to be?
Where are we now?
Analysis of **required capacity** (for delivery of products and services)
Strategic planning
How are we going to get there?
Information strategy:
• operating principles
• roles and responsibilities
• objectives and targets
• development plans

Survey
Assess the capacity of network partners
Strategic planning
Prepare plans to address weaknesses, inefficiencies and overlaps
Implementation
Initiate, monitor and review implementation of plans

Inconsistent, incomplete access to biodiversity information

Information Network Development

Coordinated delivery of information products and services

Capacity building

- dataset development
  - ensure priority datasets available
  - establish and maintain quality and accessibility
  - manage custodianship
- facilities
  - functionality to support needs
  - possibility of shared acquisition and use
- human resource development

Information Systems

- Training: (Human capacity strengthening)
  - Information Systems Principles
  - Databases and DBMS
  - Particular hardware and software
  - Networks and telecommunication
  - System development
  - Biodiversity information management issues
  - Graphics and visualisation
  - GIS
- Technical Capacity Strengthening
  - hardware augmentation
  - software acquisition
  - telecommunications infrastructure

Management and Administration

- Training: (Human capacity strengthening)
  - Selection and procurement of hardware
  - Selection and procurement of software
  - Information technology management
  - Custodianship
  - Data access principles and agreements
  - Quality management
  - Management of change
  - Project management
  - Protected area management
  - sustainable development assessment
- Technical Capacity Strengthening
  - Software acquisition (e.g. management information systems, project management tools)
  - Telecommunication infrastructure

Strengthening linkages

- user groups
  - share experiences in a specialised area, e.g. Databases, GIS, Remote Sensing, Software packages…
- working groups
  - to produce a particular result/product
  - cross sectoral
  - resolve issues, produce recommendations
- standards/guidelines committees
  - e.g. protected areas, classification systems, quality assurance, data exchange formats…
- human resource development and training
  - joint workshops and courses
  - one institute trains another
- joint projects
  - working together to produce an output

Data Management Fundamentals

Information and data required under the Convention on Biological Diversity

Article 26: National Reports

Article 6. General Measures for Conservation and Sustainable Use

Article 7. Identification and Monitoring

Information systems

- An information system is a **structured set of processes** (and associated people and equipment) for **converting data into information** , and presenting it in forms which are useful for communication and decision making.
- key features
  - processes should be clearly defined
  - data should be stored and maintained
  - data flow should be modelled
  - data should be converted into specific information products
- system components
  - people
  - database(s)
  - hardware and software
  - procedures (or processes)

National biodiversity information systems

- multi-sectoral
- multi-participant
- multi-level
- open set of applications

Principles of data management

- data are organised - for retrieval
- data are **flexible** - to simplify their use and share
- data are protected - not lost or changed
- data are shared - to reduce redundancy
- data are **standardised** - to assure understanding
- data are available - ease to access
- data can be integrated, interpreted, summarised

Data flexibility

- collect, store and quality assure once
- access many times for many purposes
- needs
  - optimum structure (e.g. fields of a database)
  - standards (are we all referring to the same?)
  - documentation (who's the source?)

Standards

- what are standards?
  - mechanisms used in collection, management and exchange of data which have been agreed and adopted by an information network/partnership
- why use standards?
  - give consistency
  - allow for consolidation
  - facilitate communication
- benefits
  - consistency, consolidation, communication
  - increased efficiency of data collection
  - lower transaction costs of data exchange
  - data can be used for many applications
- costs
  - development of standards needs substantial investment

Development of standards

- stages
  - formal standards in use
  - informal (de facto) standards exist
- development usually a collaborative effort (representative groups or committees) to review, formalise and publish standards
- review and revision process established

Types of standard

- functional e.g. data collection, validation,...
- data e.g. classification, exchange,...
- system e.g. hardware, software,...

Standards used in managing the WCMC Protected Areas Database

- Management — IUCN Category (based on management objectives)
- Geographical Distribution — ISO Country Codes

BRU

- Area: hectares
- Location: central point co-ordinates
- Habitat types: Udvardy's (other)

Standards still not available for:

- Management effectiveness (IUCN-WCPA, GTZ)
- Intermediate stages in the creation process

Data quality

- data quality is a measure of "fitness for use" for a particular purpose
- policies, judgements and decisions may be unsound if based on unfit data
  - quality of data limits how they can be used
  - limitations must be understood by users

Factors affecting quality

- scale
- resolution
- location/spatial accuracy
- frequency of error
- degree of summarisation and generalisation

Quality statement

- sources of data
- measurement methods
- assessment of accuracies (spatial and quantitative)
- processing done
- time stamp
- intended and recommended uses
- known limitations

Quality management

- continuous process, from data collection to delivery to end user
- components
  - policy
  - standards
  - assessment
  - feedback

Software

- Data Base Management Systems
- Geographic Information Systems
- spreadsheets
- statistical packages
- Image Processing systems
- biodiversity applications

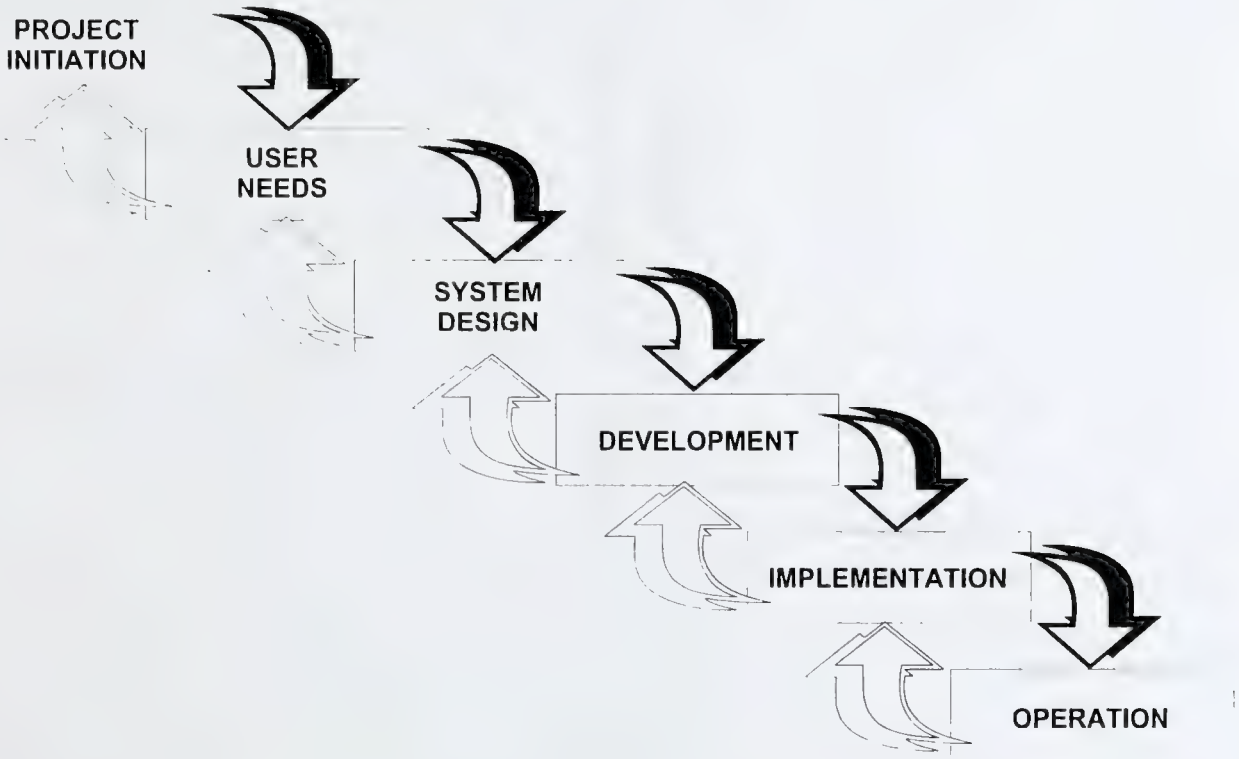
Database design

- data structure
  - conceptual model
  - logical model
  - physical model
- data dictionary

Structured Development Life Cycle

- number of distinct phases
- specific products from each phase
- phases are sequential, building on product from previous phase
- iteration is ideally only to revise and refine the previous phase
- continual review
- user involvement throughout

Structured Development Life Cycle



4. CURRICULA REVIEW OF PARTICIPATING INSTITUTIONS

School for the Training of Wildlife Specialists, Garoua, Cameroon

Dr. J. Ngog Nje

I - INTRODUCTION

The world population is now about 6 billion people. It is estimated to reach 6.4 by the year 2000, 10.0 by 2050 with an ultimate size of between 11 and 12 billion.
Unfortunately, the Earth is not extensible and therefore we have to properly use our natural resources if we want our species to survive.

This problem is a very serious and dangerous one since we don't even know how many species are living on our planet. At the moment, only about 1.5 million of the 10 to 30 million of species which are supposed to exist have been identified. The rapid decline of the world natural resources is well known and well proved now. This has led many nations to sign several conventions among them the one on Biodiversity at Rio de Janeiro in Bresil (1992).

The system of Protected areas in one of the ways to conserve Biodiversity. The World's network today contains about 30400 protected areas covering nearly 13250000 km2 which represents approximatively 8,6% the total land area.

Africa is well known for her high biodiversity. But this one is suffering of many threats. The continent has got too many problems to solve (politics instability, very high rate of population increase, the highest even compared to other continents, decrease of prices of raw materials, monetary instability, bad uses of land for agriculture, forestry and so on). To survive people rely heavily on natural resources. Some wild animal species are going to the extinction like the black rhinoceros whose population was estimated to 60.000 individuals twenty years ago and which is less than 2500 today. In spite of all those difficulties, the Continent is making a lot of efforts to conserve his natural resources.

Table 1 shows the situation of Africa (minus North Africa) in the World's Network of protected areas.

Table 1: Africa (minus North Africa in the World's Network of Protected Areas

	Number of PA	Total area (km2)	% of land area
World's Network	30400	13250000	8,6
Africa	1300	2100000	1,4

These figures though, being rough estimates, that Protected Areas in Africa are usually large (the mean being 2149 km^2 in Central and Western Africa versus 66 km^2 in Europe according to Green and Paine, 1997). But there is no use having a lot of protected areas or expanding them if you do not have among other things, qualified people to manage them. Here comes the problem of training of staff.

II - HISTORY AND THE EVOLUTION OF TRAINING AT GAROUA

2-1 History

The Conservation Movement which started in 1872 with the creation of the first national park, YELLOWSTONE (UNITED STATES OF AMERICA) has expanded very quickly these last decades as it was clearly shown by IVth World Congress on National Parks and protected areas held in CARACAS, VENEZUELA in 1992. Many national parks and protected areas were established in Africa during the first half of our century by Europeans who did not often consider the needs of local communities. Repression was the only weapon used to keep local people away from the land where they were living for many years before. The staff who was recruited to work in protected areas was taught that their main job was to make patrols, that is why most of them received the name of" guard "At this level, one could not speak about training as it is seen today. it was only in 1961 that the international opinion thought officially that the Africans should be trained to manage their Wildlife. This was decided in a meeting held in ARUSHA (TANZANIA) in *1961.* Later on two regional Wildlife Colleges were created MWEKA (TANZANIA) in 1963 and Garoua (Cameroon) in 1970 respectively for English and French speaking countries of Africa.

The aims of Garoua Wildlife School are :

* to train staff for wildlife management at all levels (main obiective)
* to conduct some research 'work in the field of Wildlife
* to run a programme of environmental education
* to participate in the elaboration and the implementation of some related to 'wildlife management`.

2-2 Evolution

For the moment, the school is training the medium level staff on a regular basis.

2-2-1 Admission

Garoua has got two courses called cycle C and cycle B (respectively certificate and diploma in the MWEKA system). Students who entered Garoua were all civil servants till May last year. The candidates for cycle C must have completed successfully at least 45 years of secondary education and the ones for cycle "B" 6 - 7 years (advanced level). Most of them have got training in forestry before.

From 1970 to 1977, the training lasted 9 months. Since 1977, each course lasts 21 months and the recruitment is being done every two years. The school year starts in September 1 and ends in May 31. Tables 2 and 3 give the trend in the intake and the number of students per country. They show that there is a mean of 12 countries for each set of about 45 students. So far the school has trained 771 technicians coming from 22 countries. Countries which are strongly engaged in the effective protected areas management have more students compared to others (Cameroon, Senegal, D.R.of Congo). There are know 49 students following the training. They come from 16 countries. Among the 820 students register from 1970 to 1998 there are 23 females.

The normal intake is about 50 students every year though the are more applications. Because students who do not benefit from scholarships cannot afford to pay fees by their own. Since Cameroonian students are not paying fees (because Cameroon is spending a lot of money through the staff salaries and the running costs of the institution), their number is comparatively high now. It has to be clear that the school is represented internationally and it will continue to recruit foreign students if they fulfill the conditions.

2.2.2 Teaching staff

Table 4 gives the evolution of the permanent teaching staff. The mean is 11 instructors per year. But since 1985, that mean is between 12 and 13 instructors. Most of them are Cameroonians. Garoua uses also 3 part-time instructors and some 5 consultants (coming from African or European countries)

2-2-3 Infrastructure

The school has got 24 ha of land. It has a library with about 2200 books, 100 journals, an herbarium with 10000 specimens for 2000 species, 3 laboratories for biology, 6 classrooms, 3 dormitories, a dining room, a kitchen, and building for administration, offices for the teaching staff, houses for nearly all the personnel. The school can receive 100 students at a time. The school owns a hunting zone of 150 ha used for practical work.

Table 2 :Trend in the students recruitment at Garoua from 1970 to 1997

Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
Year	70	71	72	73	74	75	76	77	79	81	83	85	87	89	91	93	95	97	
No. of students	18	22	36	42	39	45	50	54	51	52	50	46	52	62	46	49	57	49	820
No. of countries	5	10	10	13	12	11	13	12	14	13	12	12	12	15	13	13	17	16	23

Table 3: Number of students per country at Garoua from 1970 to 1999

Countries	Number of students		Total
	Cycle B	Cycle C	
CAMEROON	98	10~	200
SENEGAL	43	42	85
D.R CONGO	54	25	79
BURKINA FASO	2b	19	45
CONGO	21	20	41
TOCO	23	4	47
CHAD	28	19	47
C.A.R	19	20	39
BENIN	15	24	39
IVORY COAST	17	19	36
GABON	26	6	32
MALI	18	9	27
RWANDA	9	14	23
MADAGASCAR	9	6	15
NIGER	ii	11	22
MAURITANIA	7	6	13
GUINEA CONAKRY	10	2	12
BURUNDI	4	0	4
MOROCO	4	0	4
TUNISIA	2	2	4
GUINEA BISSAU	0	4	4
NIGERIA	1	0	1
FRANCE	1	0	1
TOTAL	**446**	**374**	**820**

Table 4 Evolution of the teaching staff at Garoua from 1970 to 1999

	CAMEROON	FRANCE	NETHERLANDS	GERMANY	BURUNDI	FAO
PERIOD						
70/72	T	1	0	2		4
72/75	2	1	0	2	0	5
75/77	-5	1	0	2	0	1
77/79	6	2	0	0	0	1
79/81	4	3	1	0	0	0
81/83	5	3	1	0	6	0
83/85	7	2	I		1	0
85/87	10	2	1	0	1	0
87/89	8	2	1	0	1	0
89/91	10	2	0	0	1	0

	CAMEROON	FRANCE	NETHERLANDS	GERMANY	BURUNDI	FAO
91/93	10	2	1	0	1	0
93/95	9	2	1	0	I	0
95/97	11	0	0	0	1	0
97/98	11	1	0	0	1	0
98/99	12	1	1	0	1	0

2-2-4 Training programme

The programme has been revised in 1977, 1981,1989 and in 1996. The last revision came out with a modular training system which has just started in 1997.

There are nine modules namely:

1. The Living World and its Environment
2. Wildlife Management Techniques
3. Arid and Savanna Ecosystems
4. Protected Areas Management
5. Wildlife Utilization
6. Wetlands Conservation and Management
7. Protected Areas Management ii
8. Forests Ecosystems
9. Wildlife and other Natural Resources Management

This gives opportunity to people who cannot the from their office for 2 years the modules of the choice.. During the first 15 years, more emphasis was put on natural sciences, law enforcement. Later on, the course on park planning and interpretation was reinforced. Since 1992, more attention is being put on economics, social sciences, the integration of local communities, wildlife management, wildlife exploitation.

Both cycle C and B have got 850 hours per year (of which 50% and 40% for practical respectively). Practical is being conducted in the laboratories and in the protected areas and hunting zones. The students follow also seminars organised by the school. Between the two years of training, each student has to spend 45 days in his country to work on a given topic (early June till mid-July). He writes a dissertation which he defends in front of the instructors and his fellow students. Before the modular system, the student must score 12/20 at the end of the second year (this mark is the mean between the marks of the first year and the ones of the second year) to get a diploma. The rate of failure was around 7 %. With that new system, he must pass all the modules and have at least 10/20.

2-2-5- Funding

The budget of the school is made of fees, the Cameroon Government subventions, gifts from different donors. The fees are 2800 us dollars per student per year but the students have to feed themselves. it was calculated that the real cost of the student 15 5000 us dollars (transport and monthly allowance excluded). The difference is being paid by the Cameroonian Government for staff salaries, housing and other expenses related to their

duties. At the present moment the school has a budget of about 100.000 us dollars for the running costs. But it receives from time to time support from some countries or organisations for seminars or special field trips. This brings that to around 120.000 us dollars.

III - OUTPUT

As earlier said, the school has training 771 technicians from 22 African countries. Besides this, it has also trained some 300 game guards for the Cameroonian Government. it has also supervised 25 field projects for post graduates students (Africans and *Europeans).* The school has also been involved in some projects dealing with Nature conservation like Waza-logone Project (Cameroon) which aims at the rehabilitation of a flood plain, GEF Project of Biodiversity Conservation in Cameroon.

Most of the graduates (technicians) from Garoua arc working either in the protected areas (including national parks) or in the hunting zones. Most of them are wardens or assistant wardens. Some of the graduates are even directors of national parks. As a whole when people talk about wildlife specialists in African French speaking countnes1 one refers always to Garoua Wildlife School.

The result is positive, but many countries are still lacking qualified staff at the medium and high level.

IV- CONSTRAINTS

Today, Wildlife Management is a hard and complex task because of the diversity and the complexity of problems which come in. The manager has to fight in many directions. This will require not only technical skills but also human skills. The training programme has to be adapted to real needs and this can only be achieved under certain conditions. Unfortunately there are several constraints.

4-1 Financial constraints

The training of protected areas managers is costly. It needs enough practical works. For example, Garoua is receiving students from sahelian countries and from the raln forest zone. Practical work has to be done in these two ecosystems while the school is located in the Sudanian zone. Field trips are therefore fairly expensive. As a result of it, one tends to make less field trips with limited funds. We believe that training of staff at the medium and high level should remain or be at regional level in order to make wise use of funds, personnel and infrastructure available.

4-2 Evaluation of training needs

In order to adapt the teaching programme to the future job of the managers, one has to know the real needs of the employers and this is not always the case. Therefore the School is sending a questionnaire to former students and users.

4-3 Admission

Some countries do not respect the conditions of admission, especially the minimum level of education required. As a result of it, you have classes which are heterogeneous and this makes things complicated for the instructor and even for some students.

4-4 Lack of continuing exchange programme between institutions

For example, MWEKA and Garoua have started an exchange of staff in 1985. But that programme is not continuing on a regular basis becausse of lack of funds. The expertise is necessary between institutions within the region and even between continents for training of protected area managers.

4-5 Lack of professionalism

in some African countries, the protected areas management is not considered as a profession. It is under forestry. As a result of it, this field is being either neglected or taken as a secondary matter as far as financial inputs and other facilities are concerned. Some people avoid having training in that field because they do not see advantages in their future career. Even some of the ones who have been trained do not want to work in the field when they do not have the necessary equipment to do their work. Others will look for better job. The same thing applies to the training staff. Lucky enough for Garoua. Most of the Cameroonian staff have spent more than ten years.

We believe that efforts have to be made for the professionalisation of that field so that people who are involved can be motivated and defend their rights.

V - CONCLUSION

After 29 years of existence, one could say that the Garoua has fulfilled its objectives as whole in contributing in nature conservation (fauna in particular in Africa). This result has been reached with the help of many countries and organisations to which we express our sincere gratitude's.

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School of Natural and Rural Systems Management, Gatton College The University of Queensland

Marc Hockings

1) The University of Queensland trains people for conservation and environmental management at sub-degree (Diploma), degree and post-graduate levels. Diplomas and 3-year degrees are offered both internally and externally. The delivery of courses in external mode is critically important to provide an avenue for people to upgrade their qualifications while continuing in employment. A large number of our external students are already employed protected area management positions.

The programs that we offer are:

- Diploma of Applied Science (2 years)
  - Wilderness Reserves and Wildlife
  - Nature Conservation
  - Forestry
  - Marine Resources
- Bachelor of Applied Science (3 years)
  - Protected Area Management
  - Environmental Tourism
- Bachelor of Environmental Management (4 years)
  - Natural Systems and Wildlife
  - Sustainable Development
  - Rural Systems
  - Tropical Forestry
- Postgraduate Certificate/Diploma of Applied Science (6 months/1 year)
  - Natural Systems and Wildlife Management

- Course work Masters degree
  - Master of Environmental Management

- Research post-graduate degrees
  - Master of Applied Science
  - PhD

2) Diploma programs have traditionally had a strong vocational skills component – eroded to some extent in recent years. However student demand is now leading to the re-establishment of this aspect of the program.

3) In addition, the School has conducted numerous short courses for protected area management agencies and has contributed the development of training materials in the marine parks and coastal management arena.

4) The collection, management and application of biodiversity information is addressed in a number of areas of our curricula. Two subjects form part of the compulsory core of all our undergraduate programs.

– Information Access and Communications
doesn't deal directly with biodiversity information but introduces general principles of information access, data organisation, processing and presentation.

- Introduction to Remote Sensing
understanding the nature of remotely sensed data and its application to natural resource management

- Decision Support Systems
principles of GIS and database design; the application of information in decision making, introduction to modelling and expert systems. Limited training in practical aspects of GIS use.

- Advanced GIS subjects
as the name suggests

5) Other aspects of biodiversity information management are integrated within subjects whose primary focus is not on information management *per se* but where information management is an essential tool

- Introduction to Environmental Management

- Environmental Problem Solving

- International and National Conservation Policy

- Natural Systems and Wildlife Management Case Studies

6) Four part structure to BEM curriculum

First two years provide scope and philosophy of environmental management and the disciplinary bases for the degree (eg. for NSWM strand - plant and animal biology, ecology, earth science and geography, mathematics, (chemistry), economics, law, and social science)

The first half of third year provides integrative subjects that focussing on management of the landscape followed by a 4-week field trip looking at management on the ground.

The last six months of the third year are spent on work placement undertaking a defined project. This third year is a critical time in the course – many students who have only

shown average academic ability, blossom during this year and lift their performance for the remainder of their course.

The fourth year consists of one compulsory subject focussing on case studies of environmental management and problem solving and a major group project. This group work involves a real project with external clients and is expected to be undertaken to professional standards.

Strengths and weaknesses in relation to biodiversity information management

Strengths

a) Good range of disciplinary bases covered but with a continuing emphasis on biological foundations;
b) Develops a sound understanding of the policy and management process and the role of information in these processes;
c) Sufficient training in tools of information management to be able to use them at a basic level and to work with experts in more advanced applications
d) Provides experience in applying information in a problem solving context – working with real problems and real clients

Weaknesses

a) Lack of hands-on experience in managing and manipulating biodiversity information;
b) Diploma courses are weaker in the information management area and the degree courses;
c) Coursework post-graduate courses don't provide opportunities for specialisation in information management areas.

International Centre for Protected Landscapes

Charlie Falzon

Introduction and context

Protected landscapes are described by the World Conservation Union (IUCN, 1992) as *'areas of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and~6r cultural value, and often with high biological diversity.'* It asserts that *'safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such areas.*

In 1987, IUCN and the *UK* Countryside Commission had convened a seminar in order to raise the profile of this particular protected area approach, since it offered a model that met the social and economic needs of communities whilst conserving nature, landscape and cultural values - a model for sustainable development.

The resulting **Lake District Declaration** called for the promotion of the protected landscape concept globally. In so doing it stressed the importance *of "a world-wide exchange of information and expenence on the management of such landscapes"* and the need *"to encourage atid extend training in this ftel~"*

Responding to this, the **17th IUCN General Assembly (1998) passed a** resolution calling for *"IUCN members having experience and expertise in the establishment and management ofprotected landscapes and seascapes to make such expertise widely available..."*

ICPL was established in 1990, in order to build on the resolution. Its convictions were reinforced by Principle 4 of the **Rio Declaration,** which stated that: *'in order to achieve sustainable development, environmental protectioil shall constitute an integral part of the development process and cannot be considered in isolation from it.,*

IUCN's **IVth World Congress (Caracas l992)** added strength to ICPL's sense of purpose, by reinforcing the increasing relevance of protected landscapes to future conservation/development debates.

In contrast to traditional (Category II) National Park approaches, the Protected Landscape (Category V) offers an approach to safeguarding natural and cultural values, whilst supporting communities that live in and rely on those natural resources.

ICPL was located in Aberystwyth, mainly in order to facilitate a working partnership with a UK university, in developing an educational programme in Protected Landscapes Management (see below), and also because Wales is particularly rich in many of the key challenges demonstrated by the 'protected landscapes' management approach.

Aim and purposes
The aim of the International Centre for Protected Landscapes is:

'to work in partnership to safeguard and enhance both natural and cultural resources, within viable programmes of social and economic development'.

ICPL supports the view that protected areas and reserves are a vital part of the effort to shield places of outstanding scenic, biological and cultural value from inappropriate development. However, it recognises that such places cannot exist as isolated islands, kept separate from the mainstream of human activity.

Its purpose is thus based on two key notions:

- *We must achieve conservation goals within a development context;*
- *Protected areas represent a major asset which can be realised through sensitive planning and management.*

The protected landscape approach seeks to promote a productive and sustainable relationship between people and the natural environments in which they live, and on which they so frequently depend. ICPL recognises that the strength of this approach lies both in its use *within appropriately designated areas*, and the *application of its principles in a wider PA Systems and land use planning context.*

Structure and funding
ICPL is relatively new, although its members have extensive experience in the fields of education, training and management. It began and intends to remain small, opting for the flexibility of working with a core of associates and building partnerships with other key interests.

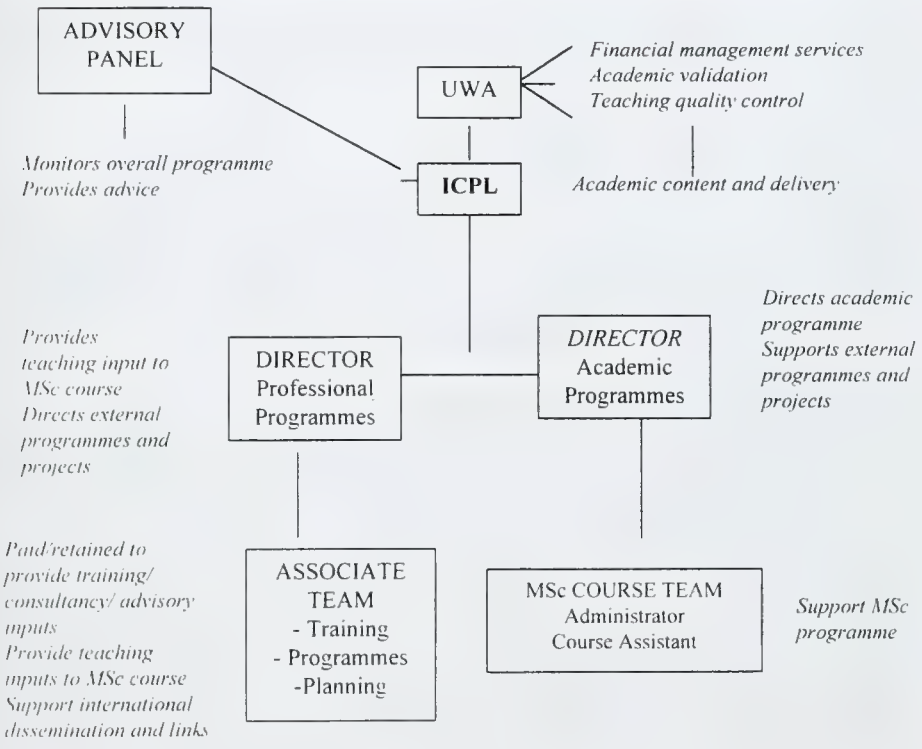
ICPL is essentially an **educational** organisation. Its educational function comprises three components:

- academic activities (the MSc course and related research work);
- training activities (basically 'in the field' delivery, according to client needs); and
- consultancy (focused advice and coaching designed to achieve client-identified projects).

ICPL is an independent organisation working in partnership with the University of Wales, Aberystwyth. Its funding comes primarily from the retention of a percentage of the fees paid for its MSc courses. This is supplemented by contracted fees on discrete projects.

Its current staff consists of two co-directors, plus two support staff to support co-ordination of the academic programmes. Two posts are contracted to ICPL to provide teaching inputs and to manage training initiatives and project support. Associates are employed from time to time to deliver specific aspects of the academic and other programmes.

ICPL structure



Developments and future directions

ICPL's priority has been the development and delivery of an intensive and comprehensive programme of professional development for existing and future managers of protected areas. The main programme normally leads to an MSc in Protected Landscape Management. The production of this course commenced in 1991, initially to be taught by distance-learning, and subsequently by attendance.

By 1995 both the distance-learning and the residential courses had commenced, and these have been successful, in terms of numbers (approximately 70 DL students and 60 full time students from over 30 countries); in terms of academic rating (rating highly in recent

TQA, and 'Specialist Recognition' by ESRC); and in terms of practical application. Between 1994 and the end of 1996, ICPL had generated more than £300,000 through these courses.

During 1997 and 1998 further modules were added to the existing programme, whilst uptake of the course has continued. The 1997 - 1998 residential intake was 16 students, with 20 more enrolling in September 1998. Currently 14 people have applied to attend the 1999 course, although final numbers will depend on the success of individuals in obtaining funding. Similar numbers of students have enrolled each year for the distance learning course.

The extent to which ICPL has been able to develop other initiatives has been constrained by numbers of staff, by the demands of course development and review, and latterly by numbers of students, but a number of initiatives are worth highlighting.

ICPL-Moi University Link Programme - Kenya
This is an academic link brokered and frinded by the British Council, in order to facilitate the redrafting of parts of ICPL's MSc course to suit East African requirements. It is anticipated that the Moi University DL course will commence during 1999/2000. ICPL will monitor delivery of the programme and will organise annual training events in support.

SPREP Darwin Initiative - South Pacific
Commencing April 1999, ICPL will support the South Pacific Regional Environmental Programme in the production of training materials and events, at a variety of levels from vocational to post-graduate.

Sagarmatha National Park - Nepal
This is a multifaceted programme, subject to a bid to the UK Department for International Development (DFID). It incorporates the production of a management plan for the park, support for community-based infrastructural developments, the development of forums for consensus-building and collaborative management, and schemes for natural resource protection and enhancement.

Saiwa Swamp/Kakamega Forest - Kenya
Subject to a successful bid to the UK International Charities Lottery Board, this programme aims to target key stakeholders, through educational, training and other supportive programmes. Its purpose will be to build a system of collaborative management at each of these two sensitive areas.

National Agricultural University - Peru
ICPL is collaborating with the NAU at La Molina, Lima to develop an MSc course in Conservation and Tourism, funded by the British Council through its link programme.

ICPL/WCPA Increasing PA Management Capacity
Currently in its planning stages, this programme seeks to develop standards of protected area management for the 21st Century. Initially the programme will carry out a detailed analysis of PA demands, organisational and professional strengths and weaknesses, based on case studies from six countries. A comprehensive range of skills, indicators and standards will be assessed, and a hierarchy of training and organisational needs will be considered. The results will be presented to the Vth World Congress in 2002.

Curricular themes
The scope of ICPL's interest can be shown by the themes covered in its MSc Course. This is arranged into eight modules, each of which contains a number of units:

Module 1: The Global Agenda, Sustainability and Biodiversity
The Global Challenge
The Earth Summit
Sustainable Development
Biodiversity
National Biodiversity Plans
Sustainability, Biodiversity and Protected Areas

Module 2: Protected Area Systems and the Protected Landscape Concept
ProtectedAreas
The IVth World Congress on National Parks and Protected Areas
The Caracas Congress - lessons, challenges and linkages
Guidelines for Protected Area Management
Protected Landscapes

Module 3: Integrating Conservation and Development Programmes
Key issues
Planning for integration
Integrating conservation and development
Developing strategic programmes and new planning techniques
Strategic Plans and Action Programmes

Module 4: Policy Context: assessment, appraisal and evaluation
Political structures, organisation and legislation
Planning policies and participation
Assessments and audits
Strategic environmental assessment
Policy appraisal and evaluation

Module 5: Management Plans and Management Systems
The management challenge
The management plan
The management plan-making process
Costing the plan and measuring performance
Information, organisation and management systems

Module 6: Partnership, participation and collaborative management
Partners in protected area management
Stewardship
NGO's and protected areas
Participation and participatory approaches
Managing participation programmes: incorporating social concerns in protected area management
Collaborative management ofprotected areas

Module 7: Communication, conflict resolution and consensus building
Communication and negotiation
Conflict resolution: philosophy, processes and procedures
Planning and conflict resolution
Conflict resolution and protected area management
Consensus building

Module 8 (i): Sustainable tourism: theory and practice
Types of tourism: definitions, categories and models
Tourism: alternative viewpoints
Ecotourism: concept and practice
Sustainable tourism: guidelines and good practice

Module 8 (ii): Raising awareness: environmental interpretation and information
The need to raise awareness
Environmental education: concepts and principles
Environmental education: practice and partners
Interpretation: principles and planning
Providing information

Links to biodiversity information management education,
ICPL is not a wildlife training institute. Its training encompasses a much wider field, since its purpose is to develop an integrative approach to protected area management. However, ICPL recognises the fundamental need to address biodiversity conservation issues, and it also recognises that intelligent decisions must be based on the best quality (in terms of content and format) information.

It therefore recognises and endorses the key role that biodiversity information management plays in protected area management.

Specific references occur throughout the course. For instance; Module One discusses the term biodiversity and considers strategies for biodiversity conservation (unit 4); explains the Global Biodiversity Strategy,national biodiversity action plans and country studies; describes twenty guiding principles on data gathering, and the assessment of biological resources (unit 5); and discusses the preparation of inventories; the evaluation of environmental stock quality and quantity, and the identification of critical environmental capital.

Module Three discusses in some detail the process of carrying out SoE reports, and addresses issues to do with carrying capacity (unit 4).

Key elements of **Module Four** are concerned with gathering and analysis of data, as part of EIA and auditing (unit 3); Strategic Environmental Assessment (unit 4); and policy appraisal/evaluation (unit 5).

Module Five entails much discussion on environmental auditing, information gathering, storage and analysis and evaluation, in the context of management plan production. It specifically considers the approaches adopted by a key UK NGO (RSPB), and the Countryside Management System (unit 3).

College of African Wildlife Management, Mweka: Curriculum Review

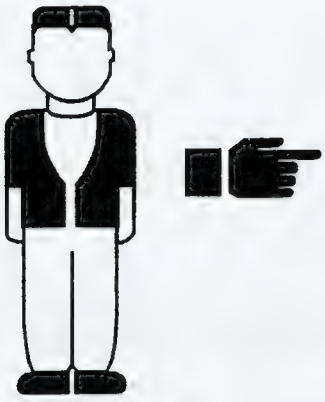
Dr David Manyanza

This presentation discusses the following areas:

- Concept of training
- Overview of CAWM's thematic approach to modular curriculum development
- Current status of information management

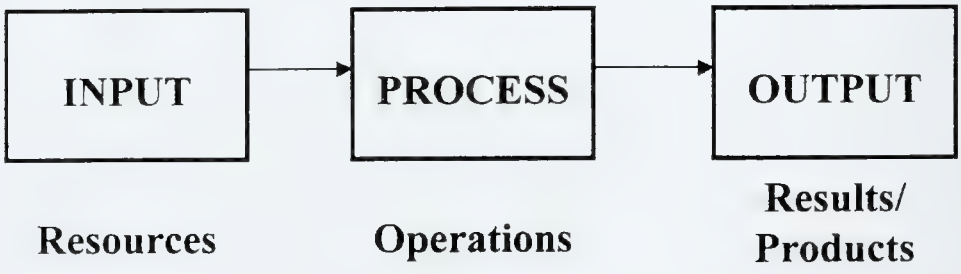
- What needs to be done

Training **Performance**



Student

The Organisation:



Training

Present Status of Information Management

+ at Training institutions:
Related *courses* on offer

- Research and Monitoring

- Data Collection and Analysis

- Statistics
  -inadequate coverage of information management

+ at the site
Massive information and data generation opportunities in:

- Baseline information
  - Resource
  - People
  - Tourism
  - Impacts
  - Utilization

- Monitoring

- Research

- **However, very little information management is taking place** Possible reasons:

Oral culture

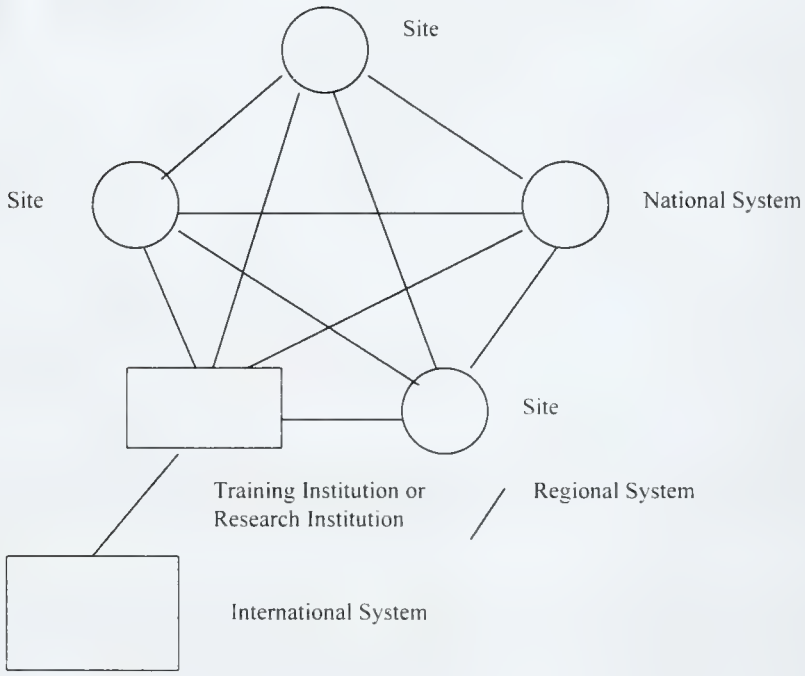
- Poor linkage between the source management process and information management
- Poor translation of research findings into management
  -discourages data generation and usage
- Poor data and information storage and retrieval system
- Inadequate number of staff

What needs to be done (Strategies):

- Improve information management courses in training institutions content
  - delivery methodology capacity

- Sensitize Protected Area Managers on the role of data and information management for enhancing effective realization of their objectives and goals

- Identify site specific critical data and information that needs to be gathered, stored, processed and used
- Demonstrate problems resulting from lack of data/information management
- Provide enhancement through networking



Curricula Review of the Regional Wildlife Management Program for Mesoamerica and the Caribbean "PRMVS" (UNA, Heredia, Costa Rica)

Isa Torrealba

(1) Introduction:

The PRMVS is the Regional Wildlife Management Program for Mesoamerica and the Caribbean, a semi-governmental organization best known for its international (regional at Latin American level) "Conservation and Wildlife Management" *Magister Scientiae*, which its acredited at the Central American level. The PRMVS deals with research, extension and graduate education, however in this talk -after a brief intorduction of what we are and how we work- it will be emphasized the curricula area.

In its structure the PRMVS belongs to a governmental costarrican university, the UNA or National University. It is adscrited to the Environmental School, which belongs to the Land and Sea Sciences Faculty, where they run three kinds of degrees with regard to environmental sciences; i.e. the "diploma" with 1,8 to 2 years of undergraduate courses, the "bachellor" with 3,5 to 4 years of undergraduate courses, and the "licenciature" with 4,5 to 5 years of courses. The later gives a graduate degree after the thesis work. Also, they are planning a masters degree at the post-graduate level. The PRMVS belongs to another Faculty, the Post-graduate System of Studies Dean. Another schools of the UNA --Tropical Veterinary, Economy, International Centre of Economical Politics, Biology and Agronomy among others-- have provided and still provide lecturers for several courses of the PRMVS' masters.

Our vision (for the future) is to become to be the main international centre in research and education --training in terms of formal and informal education and extesion-- in biodiversity conservation and management in Latin America. Our mission (our being reason) is to integrate the biodiversity conservation adn management, practice and theory, into multidisciplinaries applied actions that promote and strength the sustainable development in the neotropical region. Our motto is "for an informed and empowered society in biodiversity conservation adn management". Through several strategic objectives -- those which deals mainly with education-- we make operative our mission.

Ten years ago we used to work in a three petals flower, as an integrated system. The petals were three paths towards one goal. One objective was to train leaders through the masters degree, the other was to establish reality based models through research and extension projects , and the third was to share the information through a documentation centre with internet services and a technical journal. Currently the flower has grown up, and we developed an eight flower petals integrated system of work . These petals are:

1) Research projects of PRMVS' staff, which deal also with extension.
2) Research projects of PRMVS' associated staff, which deal also with training and outreaching. Here we work some times as a virtual sub-organization with graduate students (usually professionals with several years of experience and at least the licenciature degree, and working in their masters thesis). We develop this because of client demand in conservation area.
3) TeleSig program, or teledetection and geographic integrated information systems laboratory which deals with research, training and outreach.
4) Training through our masters degree; which in 2000 will offer a GIS emphasis and in the years after another emphasis as wetlands and the human dimension of conservation, among others.
5) Training through a capacitation program, for example through central american workshops in wetland conservation subjects addressed to rural school teachers.
6) Extension through our biological documentation center (BIODOC).
7) Extension through our journal, the Neotropical Wildlife Review.
8) Administration, through our external sources (donnors) and the UNA counterpart.

Even when we are not too many trained staff, almost each one person operates as a fund-raiser and as a manager of a part of a petal, or even a whole petal itself . For example, the research projects are subdivided in three main programs --wildlife conservation, wildlife applied management and society and wildlife-- where 7 research-emphasized projects are run. (As it was asked in the WCMC-questionnarie I would like to remark here that one of these projects deals with a World Heritage Site, the Coco Island Marine Conservation Area).

Getting to the focus of this speech our masters have suceed until the XI promotion (student cohort) and
now, ten years after, the PRMVS have let to the Latin American world 71 alumni from 22 countries and currently, still in classes or thesis work, we have around 40 students with an increase to 24 countries. We have had and/or have a few students from Asia (Japan), Europe (Spain, Italy, Germany) and from the United States of America. However, half of these have stayed working in the Latin America region becoming part of our latin society. (The others are still studying).

(2) PRMVS curricula today and tomorrow:

In this part I will use the systemic approach to show you our curricula development. This means an input, a process, and an output with the main products or results.

(2.1) Curricula INPUTS. Currently, our curricula is the consequence of two main things: (a) the academic reform of our University, and (b) successive assesments since the begining of our masters degree. The Academic Reform at UNA was a process that become more felt in 1996 and now -since 1998- is being implemented. It began with a strong evaluation done internally and externally, and part of the results were that some masters program died, another ones were born and those whom survived were improved. In regard to the assesments, since 1987 until february 1999 we can count 10 evaluation products. The most important ones were: carefull reports from foreign professors; plenary sessions with auto-assesments including comentaries of our students, guest professors and lecturers; the United States Fish and Wildlife Service assesment process after being a +10 year project funded by them.

(2.2) Curricula PROCESS. We used the former inputs in order to work in a more detailed report, theAcademic Ofert Reformulation, where the empowerment approach was followed. This is still in a draft version, however we already are having some changes. Because as we are in a governmental university the red-tape process consumes time, and as we do not want to waste it we can --with certain academic-administrative tricks-- be working with an updated curricula. In our classes we work with the constructivist pedagogic approach, even when we would like to work with the critical pedagogy this is still far away from our realistic opportunities. This new paradigm includes some tips as:
a) the knowledge is jointly constructed by students and faculty,
b) the students are empowered because their goal is to learn and grow using our masters as a part of a continual lifelong -learning within a broader system .

So, previously our curricula had a more applied-ecology focus, and now we have make strong the human dimension area. Before, Conservation Biology subject was an elective course, and now it is a begining core course. We developed trunk courses common to several emphasis in one masters which could be an academic one (M. Sc.) or a professional one (M. A.). We still keep the applied models, more related with the reality world outside the universities, as part of our masters' footprint. Some problems we still have to deal with is the time of the masters thesis (established as one year, but some students take 2 and 2,5 years), some times used as part of a "job" or part of their own career development. This has some pro's and, of course, some con's. We now are being more strict in order to cope with it.

(2.3) Curricula RESULTS.

(2.3.1) Curricula axis. As the PRMVS was born under the World Comission on Environment and Development in order to promote sustainable development in the neotropical region, we finally could reach two main "curricula axis" (the dorsal spiny of our courses):
(1) The Ecology Dimension axis, and
(2) The Human Dimension axis.

Both, focused to the conservation and wildlife management topics; making the future PRMVS' masters one with an integrated holistic knowledge addressed to conservation global problems. Our alumni are prepared to deal with the following employed-areas (severals organisations need trained people to deal with that):

a) Natural resources production,
b) Industrial and urban landscape management,
c) Biotic diversity and cultural resources.

In each of those areas they are prepared to deal with the following problems:

a) Natural-ecology systems,
b) Social-economic and politics systems, and
c) Design and high technology systems.

(2.3.2) How is Biodiversity Information included inside the PRMVS curricula?. In the PRMVS several courses deal with biodiversity information, and with biodiversity information management (Table 1). However, this topics would be highly improved just by providing better equipment (computers) and , at least, one well-trained person to capacitate the PRMVS staff.

Table 1. Courses from the PRMVS' masters that deals with biodiversity information.

Biodiversity information is given in the following courses of the current PRMVS' curricula -1999, at least with a low level of emphasis. Biodiversity information management is included in the following courses of the current PRMVS' curricula - 1999, with at least an intermediate level of emphasis

Rural sociology (core-course, refreshement level)
Animal population ecology (core-course, refreshment level)
An introduction to the economic and financial value of natural resources (core-course, refreshment level)
Wildlife management and conservation biology technics (core-course, 1st term)

Wildlife management (core-course, 1st term) Wildlife management (core-course, 1st term)
Conservation biology (core-course, 1st term) Conservation biology (core-course, 1st term)
Environmental education and social research technics (2nd term) Wildlife management and conservation biology technics (core-course, 1st term)
Vertebrate population ecology (2nd term) Geography integrated information systems (elective)
Thesis seminar (3rd term) Thesis seminar (3rd term)
Conservation and wildlife management update seminar (3rd term) Research and outreach integrated project (4th term)
Wetlands ecology (elective)
Ecological criteria for designining protected areas (elective)
Biogeography (elective)
Geographic integrated information systems (elective)

Research and outreach integrated project (4th term)

(2.3.3.) What else does PRMVS do for biodiversity, which adds power to our curricula?. The PRMVS does several core-activities:

1) A masters training program with an acredited and Central-America fully recognized degree in Conservation and Wildlife Management; currently with 71 alumni from 22 countries working actively for biodiversity conservation.
2) More less 12 workshops per year in Central America, these deal with wetlands, conservation or wildlife management.
3) Seven research and extension projects, and one GIS program (as an integrated area).
4) About 3 to 6 research associated-projects, one of this deals with a World Heritage Centre (Coco Island).
5) Approximately 6 non-curricula courses per year, some times as independent courses linked to our masters degree and another times as courses open to any person with certain minimum requirements.
6) Approximately 10 to 15 speeches per year non-curricula and non-recognized, but given from very well known and/or well trained people in conservartion related subjects.
7) Several papers and presentations in several journals, workshops and/or congresses around the world.
8) An operative biological documentation centre, focused on wildlife management and conservation (BIODOC).
9) A periodical journal, with two volumes per year (the Neotropical Wildlife Review or RVSN).
10) An operative GIS and teledetection laboratory (TeleSig).

Who does all those tasks?. Currently, the masters is taught by 3,75 full time (40h/week) lecturers or professors. The research projects are done by 2,75 full time researchers, usually with field assitants help.
The TeleSig is managed by one profesor and one technician. The BIODOC is operated by 3 persons, all of them at the technical level (without a masters in wildlife subjects). The RVSN is handled by two persons, one technician and one professor. The associated research projects and the workshops and speeches are coordinated by the same masters' lecturers. The publications are written by the PRMVS' lecturers and professors.

(3) Conclusions and Recommendations.

The PRMVS has the biodiversity information management already included into its curricula, however this task could be highly improved. The PRMVS would like to offer the BIODOC as a possible custodianship of the Latin America biodiversity information. However, we would need to update our equipment and to train more the BIODOC staff, mainly in biodiversity conservation and in wildlife management global impact and improtance. And, as Enrique Bucher said in his talk, we already form part as a USA network (from the United States Fish and Wildlife Service, USFWS) with one graduate

program in Venezuela, one in Brasil, one in Argentina and this one in Costa Rica (the most international and old one).

(4) Ackowledgements.

Thank you very much to the WCMC through UNESCO, which covered my lodging costs in Cambridge (U.K.). Thanks to the PRMVS it was possible for me to cover the travel expenses.

Southern African College: A Five Year Vision for the Southern African College or "Turning a Concrete Reality into a Functional Reality "

Prof. Eugene Moll

INTRODUCTION

The Southern African Wildlife College (SAWC) is perhaps the most challenging conservation education and training project ever launched in Africa. When Dr Joli Hanks was CEO of WWF-SA he obtained SADC approval so the German Government would fund Phase I of construction (some DM 10 000 000). The construction of the buildings to house the SAWC was a joint venture between big business in South Africa and the local community (the Bushbuckridge Builders Consortium). Although a most exciting project it was also a massively complex exercise to launch such an ambitious education and training institution in The Bush

To most people being in The Bush conjures up a romantic image of wild areas, wild things and people in relax mode living an ideal life-style. This is absolutely not so. Being in The Bush means that if you need a window latch on a water pump flange, you have to drive a few hours to the nearest town for spares. Only to be told they thought they had the part when you phoned ahead to check.. So if you cannot make the part yourself you go without, make a plan, or wait. Being in The Bush means you deal with many inefficiencies in the delivery of goods and services, and with many of the other daily challenges city folk know little or nothing about. Cities are bursting with career orientated go-getters, but they are very scarce in The Bush. ~ in The Bush the majority of people lack training, experience and sophistication, and generally there is little attention to detail. At the College we often waste a lot of time doing fairly simple tasks. Our core staff is few in numbers and work long and hard, often under very difficult and trying circumstances. We at the College also deal on a daily basis with clients, clients who can be extremely demanding; even though they themselves do not realise that they have unrealistic expectations of what the College can deliver in The Bush. We operate under stringent financial constraints and within limited time frames, yet College staff is expected to deal with all their clients cheerfully and constructively. Just ask any community worker or hostel matron about an average day? If you do not have the right personality or frame of mind you simply struggle to cope, and many cannot and do not

survive the extreme stress levels. In the job selection process we seek applicants with appropriate qualifications and experience, but have extreme difficulty measuring the right qualities of personality, political persuasion and people skills to match the challenge of working in The Bush. So we often appoint square pegs to round holes, and then battle to make them fit! Working efficiently and effectively in The Bush is extremely complex, more especially when you are under pressure. I was appointed the new Director in early May 1998. I have a different management style and different ideas and this has put an additional burden on the staff. A staff who in general is totally dedicated to achieving the SAWC vision. Thus we need to be aware that some of the constraining challenges that could prevent the successful establishment of the SAWC are still operative and will be for some time. I believe it will require a concerted and dedicated effort over the next few years to cement the foundation of the vision that saw the SAWC become a concrete reality, simply because it now has to become a functional and firiancial reality.

I heard of the vacancy of the Directorship when John Hanks faxed me details in early December 1997. My own commitment to the SAWC is total, since I am firmly of the belief that we have to make conservation, the sustainable use of wildlife and all natural products, work if we as *Homo sapiens* are to survive beyond the next century on Planet Earth. At heart I am an optimist. However, I become extremely pessimistic about the future of humankind when I assess the general lack of basic understanding most people have of the essential requirement of clean air and water, the maintenance of basic ecological processes, the need to provide adequate life support systems for all species and the lack of understanding conservation agencies have of the commercial imperative. Crucial to the success of our future on our planet is that people, and more particularly people who live adjacent to parks, receive direct benefits derived from these parks. People are our future, they are our first line of defence - but more importantly they are also our first lines of offence (particularly those who are neighbours to parks who increasingly in the future will be in the front line fighting for the right of all species to be given a fair chance to survive). If people do not facilitate a fundamental change in attitude towards conservation within the next decade, the pendulum may swing too far. Who really knows if this has not already happened? Humans tend to be optimistic, but perhaps we conservationists are myopic to reality! Whatever the case I certainly believe in the future of the College, and believe that most people wish to contribute to a better conserved world, particularly in our own sub-region, and what better place to start but in one's own back garden! As such there is a hard core of people who are committed to move forward together. We may not all agree at all times with all decisions, but as long as we all share the same vision our goals in real life will be achievable. It is my hope and even my dream that we can work together constructively to build this vision, and make it all begin to happen over the next few years. The College's success is, I submit, a critical factor in whether conservation in the sub-region, and for that matter Africa and the World, succeeds. Our species has an enormous responsibility to shoulder and it is high time we accept the responsibility, and become a positive catalyst for real and meaningful change. It is time too for Africans to show the rest of the world how to change and begin to live sustainably; we after all evolved here so it seems fitting that Africans should lead the conservation revolution into the 21st century.

SAWC's RECENT HISTORY

When I look back on what the SAWC has been able to achieve in the very short time it has been operational I am amazed at the progress. It Is not too surprising that the main thrust has been to get the buildings operational, get the first Short Courses going, and to recruit the first students for the Certificate Course. Thus up to now the College has had to concentrate on matters of a day-to-day nature. It is only now as we draw nearer to the end of the first full year of operation, that we are able to begin to identify future priorities. It is essential that we now provide the platform on which the SAWC can move to the future. So it is important, and more so at this critical stage of our development and growth, to highlight where I believe we should be going with regard to our vision, and how this growth and development may be achieved. Our aim for 1999 should be "turning a concrete reality into a functional reality", this to be our goal during the next five years.

Having been at the College for only a fairly short time, it is not possible for me to provide a great deal of detail at this stage. But by the end of 1998 our new Business Plan will be complete and this will provide a more detailed financial plan for the future. As a young institution I believe we have already come a long way in a very short space of time. 'A time in which we have achieved a number of significant milestones, but a time in which we have often struggled to achieve our goals simply because we have not had sufficient funds to work effectively and efficiently. At times we have even made some mistakes (some of which have already been rectified, and others I hope we will rectify over the next few months and in the coming years). Starting a new education venture from scratch is an extremely ambitious, perhaps even a foolhardy project. However we have a mission to train protected area managers and the community neighbours to these parks; a mission that may well provide a solution for the long term survival and well being of our species.

Before I get to the details of my vision let me pay a tribute to the efforts and inputs of all those who have brought the SAWC to the present. From my dealings with a good number of people and clients, the SAWC has already made a major impact on the conservation world. Much of this impact can be attributed to the vision of those who initiated the SAWC, and to those who initiated the first courses. Certainly the time was ripe for such a College, and our position in the Lowveld of South Africa has some distinct advantages. The buildings and siting of the College bring strengths but, as with all major projects, there are also certain constraints, perhaps even mistakes, which in hindsight are much more obvious than during the euphoria of the conceptualisation,' construction and development phase. As I see it we are now in the development, consolidation and, more importantly, growth phase. I say growth advisedly because I believe that having seized the initiative we have to keep "running with the ball" or else we run the very real risk of falling short of our goal. As a species *Homo sapiens'* main characteristic is to ignore the really big issues and concentrate all efforts on minute. I believe this could well be our species evolutionary nemesis: we totally dominate the biosphere, yet this domination has essentially been technological, it has ignored natural processes. Time is fast running out for the "clever species" to become wise and change from exploitation and obfuscation to seek ecological sustainability. My real question is "are we up I the challenge?"

VISION

So what then is my vision for the College? And will we get the financial backing to support this vision? For without the fullest financial support and that of the nature conservation and environmental fraternity, we will fail to meet the very high expectations the general community have for the SAWC. Stem words indeed, but am totally convinced that this is the reality of the situation. Never in my some 35 years as a professional ecologist, conservationist and educator have I felt so deeply and strongly about a mission. This has become a personal ambition, to see the SAWC as a world centre of excellence in conservation education and training in the next five, certainly ten years.

I shall just briefly set the scene as I see it, so you the reader can obtain some understanding of what 1 see as our present context.

The people population of the world has grown exponentially since the industrial revolution, such that today we have very few "ecosystem" people left. Most of us are "biosphere" inhabitants, and in this context I refer to from whence we source our goods and services. Ecosystem people are those who source all their goods and services from within their own ecosystem, much as the Khoi San people did in the 1500's! As such ecosystem people must have a detailed and intimate knowledge of ecology, because their very lives depend on the sustainable use of their system. Biosphere people on the other hand rely on many remote ecosystems to provide them with their goods and services. As such the vast majority of the current world population has become disconnected and dislocated from the natural ecosystem which our lives ultimately depend. It is as though the people of today's western world live in an impregnable envelope of virtual reality, in a world driven and dominated by economics and entertainment. City life is their reality, a life where even many personal relationships are ephemeral. Perhaps it is too much to expect of these people that somehow a miracle of reality will occur and that they will spontaneously embrace the latent knowledge of holistic ecosystem management.
From where I sit I submit that each and every one of you, even all those who espouse the sustainable development paradigm, do not actually practise in your daily living what you preach! We never have and we probably never will! Harsh words indeed, but this is the reality of our technological sophisticated twentieth century. However, I do not necessarily believe that this is totally wrong, the world is bountiful and a certain amount of wastage is apparently sustainable, but we can no longer totally ignore the forces of nature. The simple fact is that we inhabit a do system. The world is a global village, and as its inhabitants we are custodians of finite as well as the renewable resources. I know that those of us who are environmentally sensitive are already aware of the shortcomings of human beings. There is a growing number of people wanting to change our species' behaviour I that we have a long-term future on planet earth. Thus there is little need for me to talk about global climate change and the risks associated with extinction to the environmentally aware. Yet your city dwelling friends and colleagues in particular many of whom will already possess a passing acquaintance with the concepts of ecosystems and/or biodiversity conservation, have little real understanding of what this actually means day to day. They are already much too dislocated and disconnected from the world

to comprehend the real problems facing *Homo sapiens*. However, it is my belief that in the SADC region there are still a good number of people who are not yet totally divorced from ecosystems (be this physically, or at least culturally), and for one reason or another are anxious to conserve their heritage. This may mainly be as a means of earning extra dollars to improve life style, or it may be for some deep-seated ecosystem reason. This is not to be debated here. The vital ingredient is that there is a lot of goodwill and knowledge these quasi-ecosystems, park neighbours in the SADC region, and herein lies the hope for the future of human kind.

I firmly believe that we, in this part of Africa, have the best chance of anyone in the world of demonstrating that conservation can be a way of life, and can offer an alternative to the greedy, careless, and seriously ignorant world we inhabit there is a growing awareness of a "need to change". But I do not believe there is yet the necessary commitment. However, as global change bites this commitment will grow. But by then it may well be too late? So it is time to start the process of change now, and the SAWC offers a real opportunity and hope for the future. Our advantage is that because humans evolved in Africa (that which we now view as the pristine African landscape) it is in fact those gene pools that have survived onslaught of humans, their fire regimes, and their forms of agriculture and settlement patterns over the last 3000 000 or more years. Thus most African landscape in fact skilfully manicured ecosystems which pre-historic people managed, and in "sustainably" until Colonial times when their lands were occupied by technologically sophisticated but ecologically ignorant settlers. Thus despite this extremely long history of living with people the African continent is still one of the most biodiverse regions. Added to this we in the SADC region have the big five, and please do not underestimate their significance in the past, in the present, and for future conservation action programmes that have and will continue to capture world attention. It is simply because of the diversity of our large mammal fauna that Africa is THE tdurist destination of the world (there are problems like violence, personal safety, malaria, AIDS, TB and other health hazards that are of concern to tourists, so we must be aware of these very real constraints). If we In Southern Africa cannot get conservation to work effectively in the 21st century, then what chance has the rest of the world? A world where massive changes to habitats, as a direct result of the recent radiation of *Homo sapiens*, has already resulted in a significantly fragmented landscape that will need a huge effort if these new lands are to adequately conserve their biodiversity. Newly colonised land like the Americas, Australia and Madagascar have already witnessed the extinction of many species since recent human occupation. This is because these systems were not resilient to human impacts. They are not like Africa, the cradle of human evolution, so it must then be Africa that has to teach the world how to live in an ecologically sustainable fashion.

So my thesis is quite simply that, particularly in Southern Africa, we have an existing network of protected areas, game reserves, national parks or whatever; all of which are prime natural resource areas of great biodiversity. I submit that we also have an existing biophysical information data base that enables us to adequately conserve these areas in the short to medium term (decades to centuries). And much more important is that most of these parks are surrounded by land that has the necessary biodiversity and ecosystem

integrity to complement and reinforce the existing and proposed network of protected areas. In these surrounding areas human population densities are generally reasonably sparse though growing, which is alarming, and land management practices generally are not yet too much of a serious threat to the adjacent protected systems. So there is a unique but small window of opportunity to get these communities intimately involved in conservation and sustainable living practices; to regain the ecosystem knowledge that people are beginning to lose, to restore the connection between human life and well being, and to implement sustainable land management practices. Also existing in these regions is a rich and varied oral cultural context of how the land has and can be managed, and it is just this rich cultural knowledge base that offers an additional attraction to tourists. If we continue to manage our protected areas using our existing knowledge base, and more important, in fact critical for our species future, better conserve the lands that surround them, we will then have started the environmental revolution that can and will save our species (and the myriad of other species) from extinction. This is in fact the only way biodiversity conservation can work; we have to renew the partnership between humans and nature. This dream 'an and must become a reality. So we at the Southern African Wildlife College have the very serious and important task to help guide and turn a dream into reality. This can be achieved by facilitating the SAWC to train and up-skill existing protected area managers (PAMs), train a new army of PAMs for the next decade and, more significantly, provide the necessary skills to build the capacity of those people who surround the parks to become conservation's second line of defence and first line of offence. By meeting this challenge we will be able to provide a living example to teach the world that conservation pays, and pays handsomely, as it provides for a sustainable way of life.

To attain this goal the College has to provide training at all levels to existing protected area managers, and to the very large number of future protected area managers required to staff much larger parks and/or natural resource areas. But more importantly we have to work at all levels with and in local communities that surround these protected areas which is really the Biosphere Reserve concept, and hen we have to take this message to the cities; but this last step is, I submit, not the college's core business. We already have enough challenges for the next decade!

SPECIFIC TARGETS

A five year plan

In this phase of our development and growth the College must establish itself as the premier conservation education centre for the training of practicing and future PAMs, and of park neighbours. This is not an unachievable goal, and by the end of 1998 we will have formulated a Business Plan aimed at realising this goal.

From a training perspective I believe we need the following programmes in place as soon as possible:

1. We need to run specific and tailor-made Short Courses both at the SAWC, and in country, to provide skills and competency to upgrade the existing framework of PAM's. Many of these Short Courses are already in place, some have yet to be evolved, but I am confident that we have the basis from which to launch an even more ambitious programme. Certainly from the feed back received we are already becoming a regional force.

2. Our first Certificate Course has overcome some teething problems and next year this Course will be greatly improved as a result. Our strength is that we acknowledge that the field of conservation education is one that is evolving rapidly, and we are strategically placed to deal with such changes. The existing students in the Certificate Course have been most impressed by the very high standards that have been set, and we have received very positive constructive criticism from their agencies. Some complements, such as an "admission" of a diploma graduate from another recognised college that our Certificate Course is of a higher standard than their diploma, have already been noted.

3. In 1999 we are running a Certificate Course and a Diploma Course in Protected Area Management. There are many good educational and certainly marketing reasons for running both courses next year. Most importantly the SAWC has set a high level of expectations and there is great demand for both courses. Also we need to make optimum use of our facilities by increasing bed occupancy so we can hasten Phase II of construction which will bring the SAWC closer to full capacity.

In 2006 I envisage that we will run two Certificate Courses and two Diploma Courses. One of each designed to meet the needs of PAMs, the other to meet the needs of community neighbours. The core content of each of these will be similar, but the detailed case studies and particular skills will need to be different. I envisage some 60% or so overlap in course materials. This will bring certain efficiencies of scale, but most importantly will put us at the forefront of education and training of this kind. There is an urgent need for this to occur and I believe it is our duty to make it happen. Thus for the first time PAM's and their neighbours from the surrounding communities will be trained

together, building a better future for conservation by increasing the capacity of previously disadvantaged communities.

Obvious such planned growth, a doubling of students in 1999 (to 60 full time participants) and again in 2000, has financial implications. But we believe that these can and will be met by our new Business Plan. Some of the immediate implications I will deal with later. Right now I want to concentrate on the strategic education and training aspects, as this really is the College's major function.

In this regard I must say that in the very short time I have been at the SAWC I have been enormously impressed not only by the very wide range of visitors we have hosted, but also by their enthusiasm and qualified commitment to assisting us in attaining our goals. I believe there is more than sufficient goodwill to make this vision reality. We just need to carefully plan the strategy to facilitate the implementation of the vision. At the end of five years I estimate that we will have hosted well over 2000 Short Course participants, and 300 Certificate and 250 Diploma graduates. But the good news does not end there. Right now we are in the process of developing very exciting initiatives for specific training courses in partnership with other companies and organisations. For example, we are hoping to brand courses in Mozambique in partnership with the Game Ranger Association of Africa and the African Field Ranger Training Services to train some 2 500 field ranges in anti-poaching management over the next five years. Together with the SANP, CONSCORPS and perhaps FEDICS we hope to develop courses for guides who will drive open vehicles in South African National Parks, and lead walking trails in the 'pristine' areas being set aside for such trails in the new management plan for the Kruger National Park (about 22% of the total area of over $2x10^6$ ha). The projected market for this training is some 200 in 1998 and doubling in subsequent years. This tailor-made training will take place both on site at the SAWC and in areas where these guides will work. The estimated total number of people in these guide-training programmes is in excess of 10001 Exciting stuff indeed, yet at the same time a little frightening as we have much to do and develop in this very short time-frame. To the College's benefit is that there is now urgency to train and build capacity, and as global warming bites more and more donor and aid monies will flow directly into excellent conservation education and training programmes. The SAWC is strategically poised to take this lion's share of such monies in the African sub-region.

So far I have only focused on the SAWC's educational activities for PAMs. But this is not all we must do. We have also to substantially raise our profile in the park neighbour communities. We have already initiated this by holding the first Community Committee meeting. We are also starting to develop community partnerships relating to such concepts as Small Business Units, education programmes in English and computer literacy, and by the provision of joint scholar/student training initiatives we are building vital bridges' for the future with our own neighbours. Thus by the end of five years we should see fairly major achievements, all of which will raise the profile of the College and have a very positive impact on conservation. We still need to greatly expand this community-based programme, and my vision on how this is to be achieved has not yet

been finalised. I know this will be a hard road to hoe, but we must and will be successful. Our future depends on it. Only recently a local community leader visited me in my office to tell me "that the College is now seen by the local community". Enormous praise indeed, emphasising the critical importance of excellent park neighbour relations.

Then there is the recently launched Central Lowveld Biosphere Programme which is funded through a World Bank/European Union initiative "Managing Environments Locally in Sub-Saharan Africa" or MELISSA programme. The aim is that by the end of five years there should be the proclamation of what we in Western terms know as a "Biosphere Reserve". I am hoping that local people will find a new, more appropriate African name for sustainable and shared co-existence for economic and conservation gain.

A ten year plan

In my ten-year plan I see a much greater need for in-country training, as in a Train the Trainer approach. This I believe needs to be much more focused on park neighbour communities than on park agencies, but much will depend on the tourism dollar and other global forces that will by then be shaping the 21st century. There are already a number of published future scenarios that have been developed for the next few decades, unfortunately most have totally, or more-or-less totally, ignored the limitations and/or constraints that are being, and will continue to be, imposed on the world by the progressive breakdown of ecosystem function. This is simply because most of the people currently developing future scenarios are drawn from the disconnected and hence dislocated biosphere users. I have to date not seen an ecosystem level future scenario. I believe we at the SAWC could start to fill this role by taking some initiative in leading an ecosystem contribution to the global debate.

Thus in ten years time I see the SAWC will be a world force, in not only park neighbour relationships and PAM education and training, but it will also be at the centre of the debate that must occur before we can start to live in a much more sustainable fashion on planet Earth.

PROSPECTUS FOR THE CERTIFICATE COURSE 1999

BLOCKS	MODULE	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Induction and Evaluation	1: Induction (5) *	1 – 5										
	2: Team Building (3)	8 – 10										
	3: Basic Learning Skills (7)	11 – 19										
2. Ecological Management (Data collection will be run a sub theme through most of the modules)	4: Philosophy and Ethics of Conservation (2)	22-23										
	5: Introduction to Protected Area Management Plans (1)	24										
	6: Environmental Impact Assessments (2)	25-26										
	7: Conservation and Community Ecology (8)		1-10									
	8: Vegetation Management (8)		11-22									
	9: Climate (2)		23-24									
	10: Soils (5)		25-30									
	11: Introduction to the Management of Aquatic Systems (5)		31-5									
	MID SEMESTER CONSOLIDATION PHASE/EXP TRG (10)			6-18								
	12: Provision of Artificial Water(3)			19-21								
	13: Fire (3)			22-24								
	14: Unique Sites Management (5)			26-30								
	15: Animal Management (8)				3-14							
3. Infrastructure Management	16: Basic Workshop Skills (3) - THEORY				17-19							
	17: Transport – roads and tracks (1) - THEORY				20							
	18: Fencing (1) – THEORY				21							
	19: Buildings (2) – THEORY				22-24							
	20: Domestic Water Supply (3) – THEORY				24-26							
	21: Power (1) – THEORY				27							
	22: Waste Management (1) – THEORY				28							
	MID YEAR PROJECT IMPLEMENTATION PHASE				29 May – 31 July							
	16: Basic Workshop Skills (4) – PRACTICALS							2-5				

BLOCKS	MODULE	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	17: Transport – roads and tracks (1) – PRACTICALS							6				
	18: Fencing (1) – PRACTICALS							9				
	19: Buildings (2) – PRACTICALS							10-12				
	20: Domestic Water Supply (2) – PRACTICALS							13-16				
	21: Power (1) – PRACTICALS							17				
	22: Waste Management (1) – PRACTICALS							18-20				
	23: Vehicles (5)							23-27				
4. People Management	24: Personnel Management and group interaction skills (12)							30-11				
	25: Community-based Conservation (10)								13-24			
	26: Tourism Management (2)								27-28			
	27: Interpretation (3)								29-1			
	28: Environmental Education (2)									4-5		
5. Administrative Management	29: Office Management (3)									6-8		
	MID SEMESTER CONSOLIDATION PHASE (9)									9-17		
	30: Financial Management (5)									18-22		
	31: Transport Administration (3)									25-27		
6. Securing Natural Resourcea	32: Ensuring Ecosystems Integrity (20)									28-20		
	33: Compliance and Control (5)										22-26	
	34: Legislative Guidelines and Implications for Law Enforcers (5)										29-3	
Ecological Management contd.	35: Preparation and Implementation of Protected Area Man. Plans (5)											6-10
	GRADUATION (Departure on Monday 13th December)											11

2nd semester makes use of Saturdays and public holidays for training

no evaluation breaks as practical will be ongoing and theory in the form of assignments and verbal evaluation

driving skills will be taught through the year in preparation for the module in August, learners licence by end Feb. and drivers licence by July

? SUGGESTED TRAINERS, TO BE CONFIRMED.

PROSPECTUS FOR THE DIPLOMA COURSE 1999

BLOCKS	MODULE	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Block One: Induction and Evaluation	1: Induction (2) *	1-2										
	2: Team Building (3)	3-5										
Block Two: Planning , Development and Management Principles	3: Strategic Project Planning (10)	8-19										
	4: Report and Proposal Writing (10)	22-5										
CO-ORDINATED BY CP	5: Integrated Protected Area Planning and Management: (18) (to include the following aspects in context of savanna ecosystems management) • Conservation Biology • Ecological Management • Cultural / Natural Resource Sites Management • Data Management • Infrastructure Management • Financial Management* (PvS) • Personnel Management* (DO) • Community –based Natural Resource Management* (MTU/DO)		8-1 **MID SEMESTER BREAK #** 5-9 April									
Block Three: Freshwater Aquatic Ecosystem Management	6: Freshwater Ecological Management (15)			12-30								
Block Two: Planning , Development and Management Principles contd.	7: Protected Area Development Plans: (20) • Environmental Impact Assessments (EIA) • Integrated Environmental Management (IEM) • Environmentally Responsible Development • Legal Issues in Protected Area Development				3 – 28							
Project Phase	**MID YEAR PROJECT IMPLEMENTATION (44 days)**				29 May – 31 Jul.							

BLOCKS	MODULE	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Block Four: People Management	8:Personnel Management and group interaction skills: (25) • HR management skills • Recruitment and placement of staff • Performance appraisals • Job descriptions and performance by agreed objectives • Training needs analysis and planning for staff development • Mid-level generic management skills • Train-the- trainer • Democratic leadership • Consultative management • Managing relationships with the external environment							2 Aug. – 5 Sept				
	9: Community-based Natural Resource Management (10)								6-17			
	10: Community Interaction Skills (5)								20-24			
	11: Visitor Management skills: (5) • Customer service • Visitor empathy • Marketing and advertising • PR/Communication skills • Drafting and application of rules and regulations • Managing visitor expectations • Responsive planning								27-1			
Block Five: Tourism / Visitor Management: Facilities and Interpretation	12: Tourist Facilities: (15) • Development • Management : Financial implications Long term viability Privatization of facilities Corporate initiatives Government sector initiatives Design and construction considerations									4-22		
	MID SEMESTER CONSOLIDATION AND FINAL PROJECT REPORT PREPARATION (5)									25-29		

BLOCKS	MODULE	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	13: Interpretative facilities development and management (10)										1-12	
Block Six: Business Management	14: The Principles of Business Management: (10) • Bottom-line management • Budgets • Securing donor funding • Viability of facilities • Economic importance of Ecotourism										15-30	
	STUDY (5)											1-5
	FINAL ASSESSMENT (5)											6-10
	GRADUATION (participants depart on Monday 13th December)											11

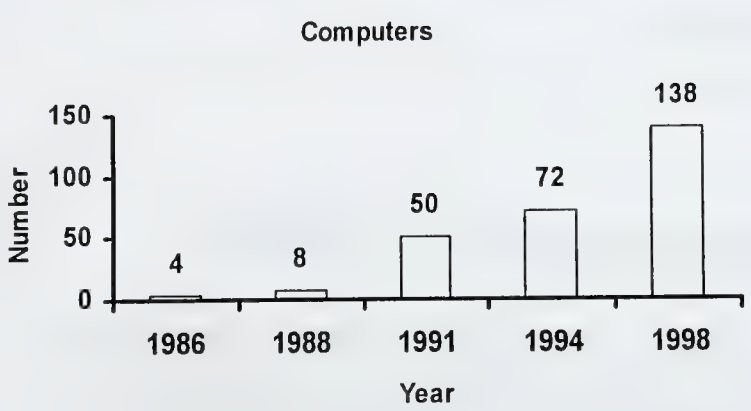
- Numbers in ( ) = days
- The use of Saturdays has been planned for training where necessary
- # CONSOLIDATION, PROJECT PLANNING AND PREPARATION
- ? SUGGESTED TRAINERS, TO BE CONTACTED.
- * PRIVATE TRAINERS

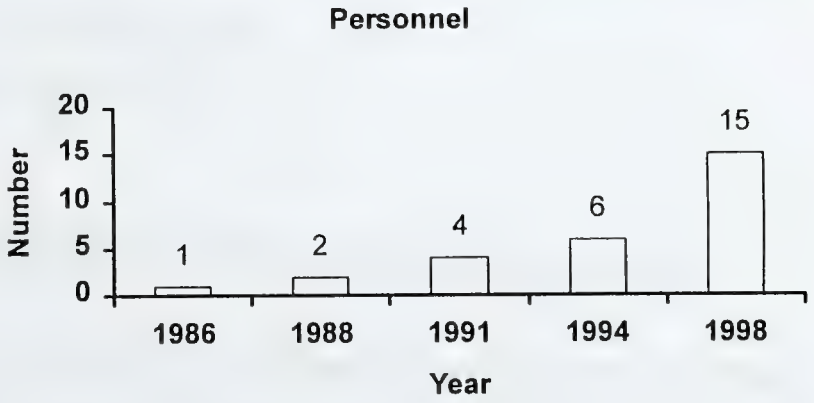
APPLICATION OF MODERN COMPUTER TECHNOLOGY

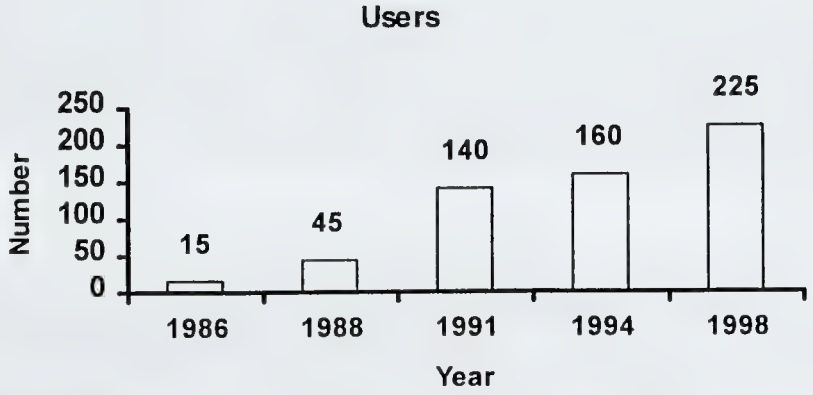
Initiatives at the Wildlife Institute of India

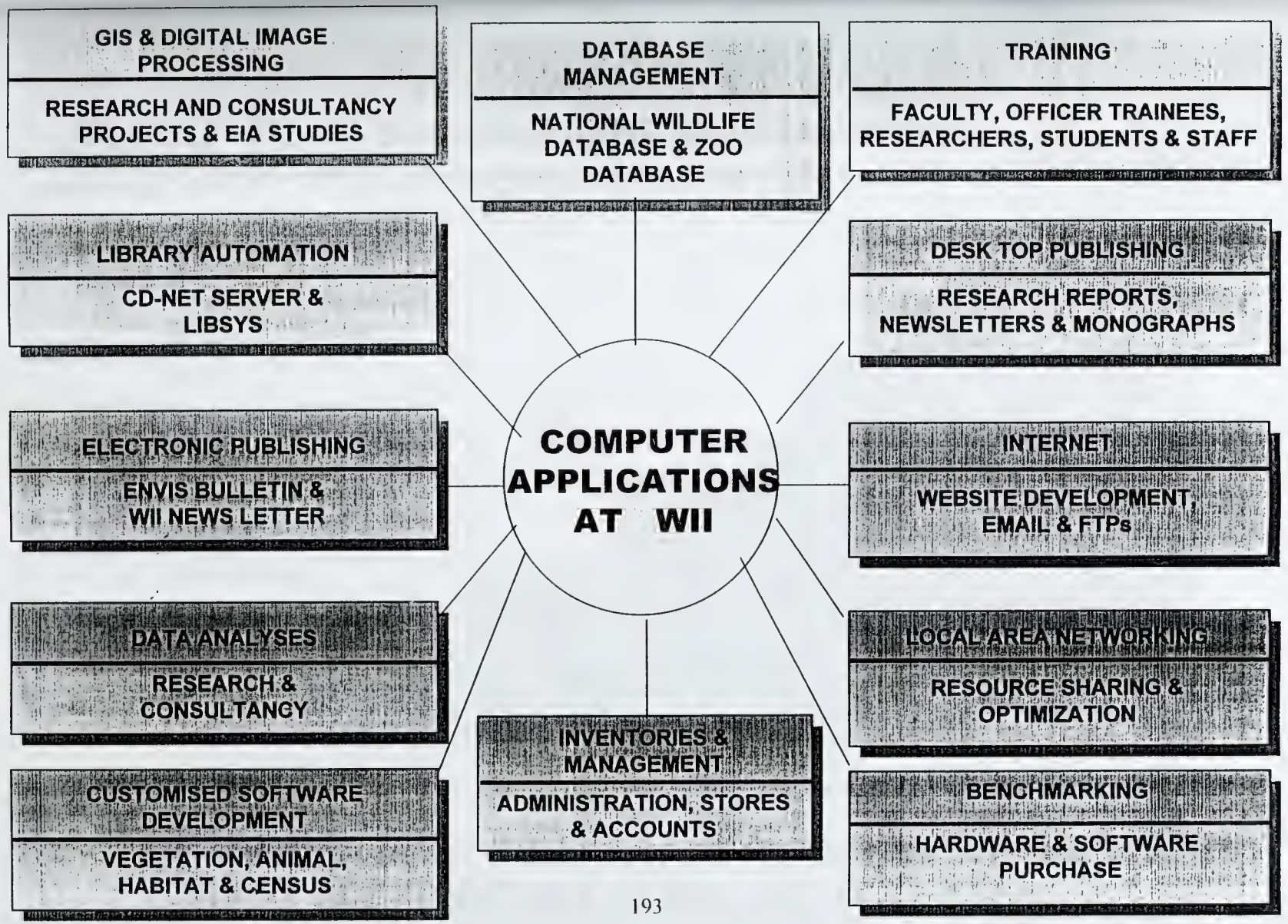
Rajesh Thapa
System Manager, WII

GROWTH OF COMPUTER FACILITY IN WII

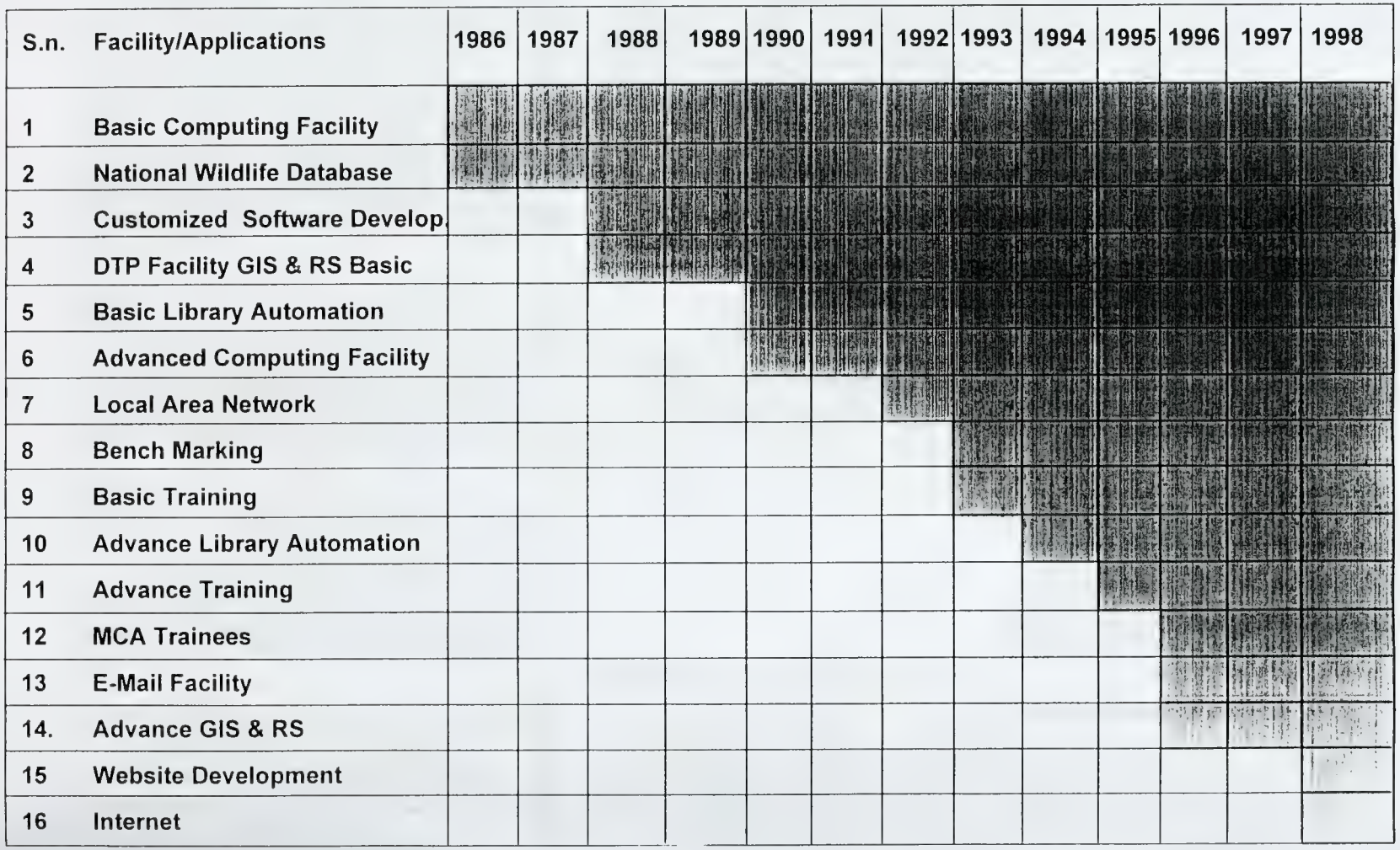






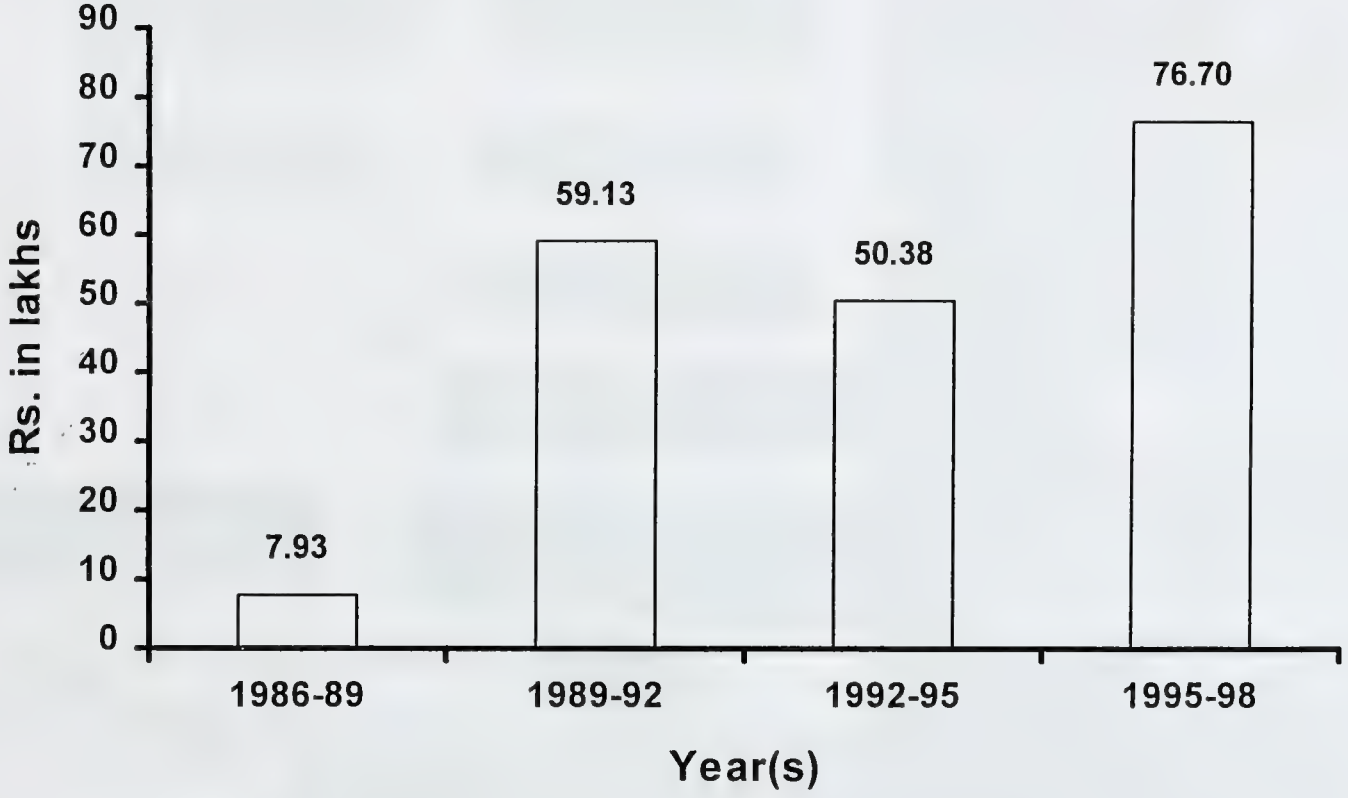

GIS & DIGITAL IMAGE PROCESSING
RESEARCH AND CONSULTANCY PROJECTS & EIA STUDIES
DATABASE MANAGEMENT
NATIONAL WILDLIFE DATABASE & ZOO DATABASE
TRAINING
FACULTY, OFFICER TRAINEES, RESEARCHERS, STUDENTS & STAFF
LIBRARY AUTOMATION
CD-NET SERVER & LIBSYS
DESK TOP PUBLISHING
RESEARCH REPORTS, NEWSLETTERS & MONOGRAPHS
COMPUTER APPLICATIONS AT WII
ELECTRONIC PUBLISHING
ENVIS BULLETIN & WII NEWS LETTER
INTERNET
WEBSITE DEVELOPMENT, EMAIL & FTPs
DATA ANALYSES
RESEARCH & CONSULTANCY
LOCAL AREA NETWORKING
RESOURCE SHARING & OPTIMIZATION
INVENTORIES & MANAGEMENT
ADMINISTRATION, STORES & ACCOUNTS
CUSTOMISED SOFTWARE DEVELOPMENT
VEGETATION, ANIMAL, HABITAT & CENSUS
BENCHMARKING
HARDWARE & SOFTWARE PURCHASE

TREND IN GROWTH OF SERVICES

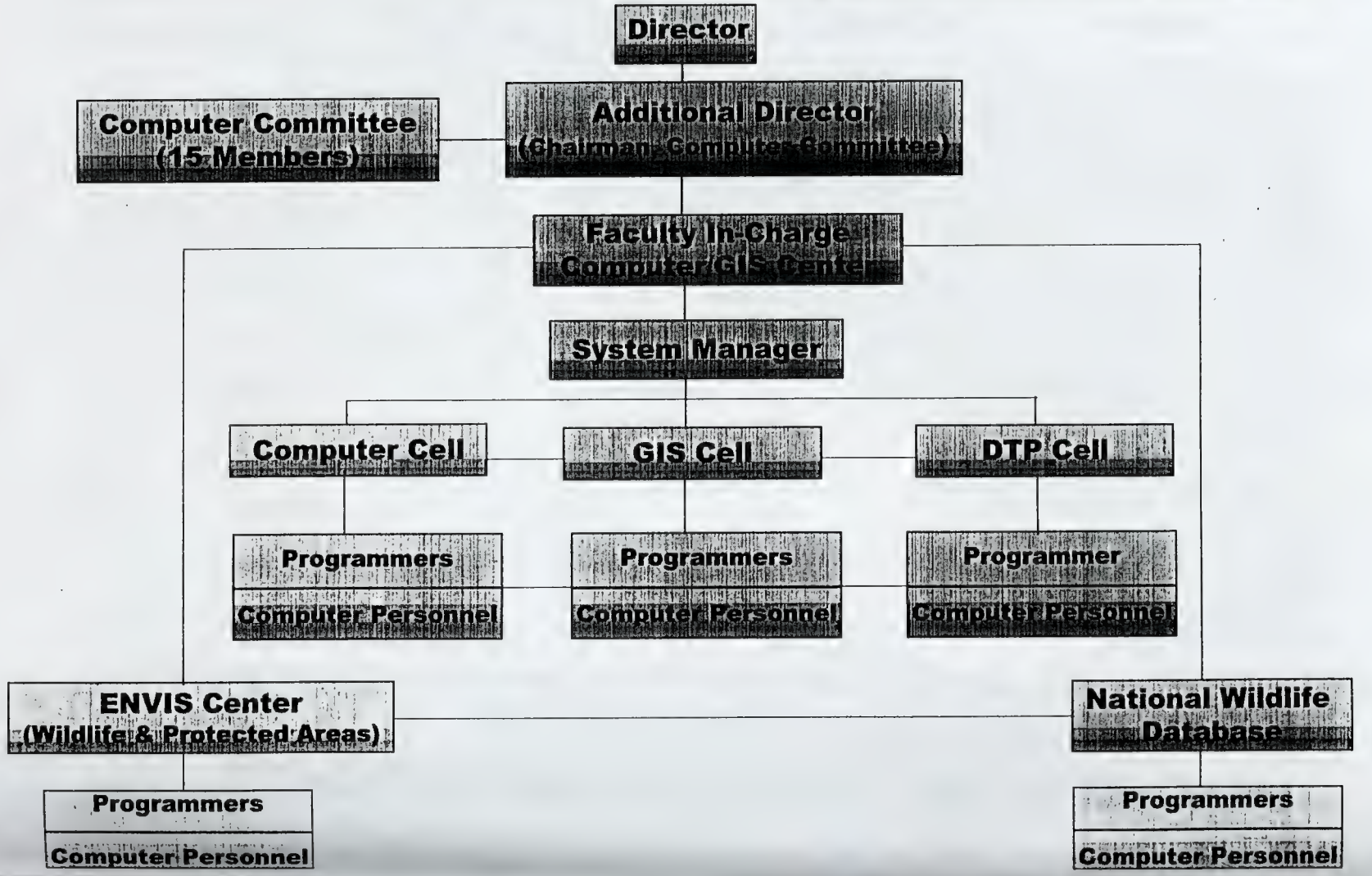


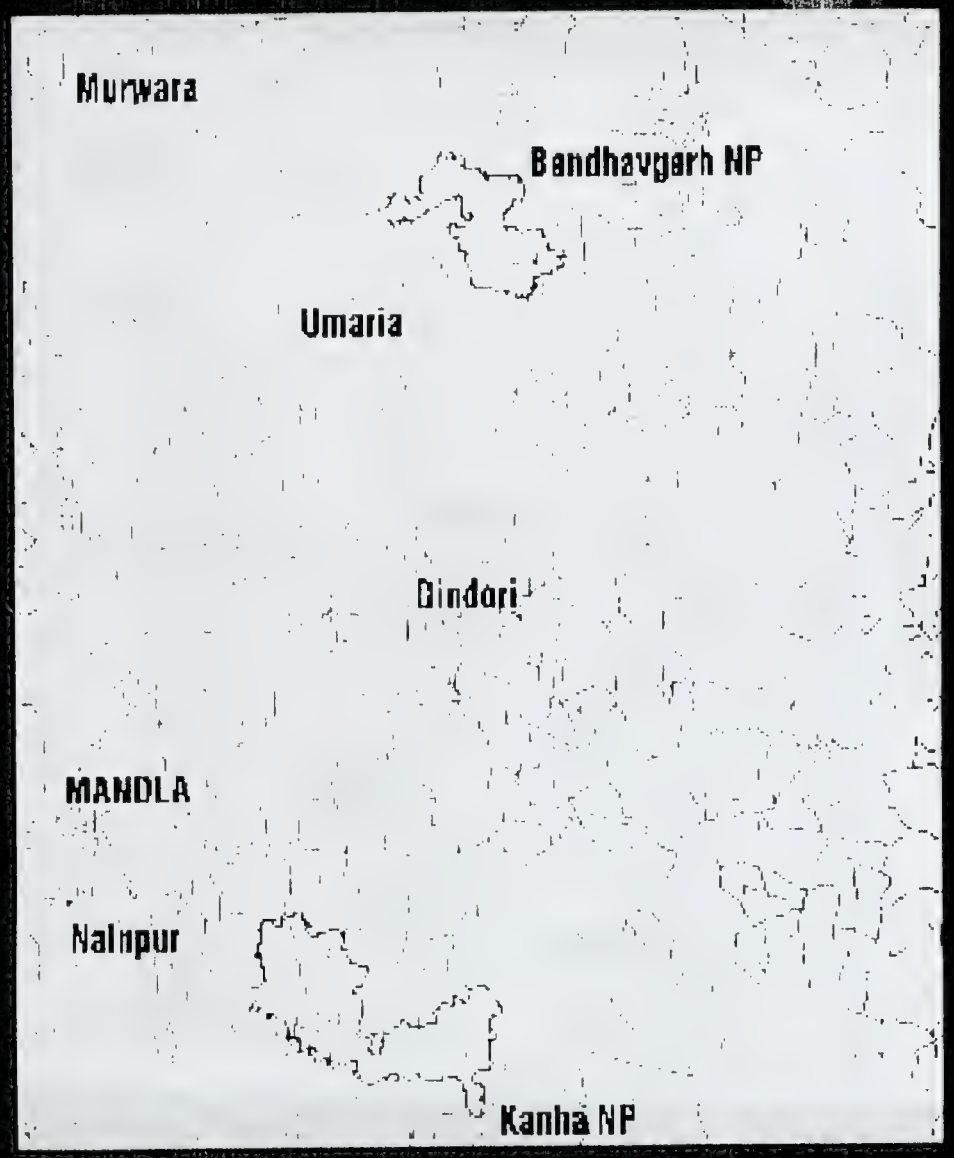
S.n.	Facility/Applications	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
1	Basic Computing Facility													
2	National Wildlife Database													
3	Customized Software Develop.													
4	DTP Facility GIS & RS Basic													
5	Basic Library Automation													
6	Advanced Computing Facility													
7	Local Area Network													
8	Bench Marking													
9	Basic Training													
10	Advance Library Automation													
11	Advance Training													
12	MCA Trainees													
13	E-Mail Facility													
14.	Advance GIS & RS													
15	Website Development													
16	Internet													

EXPENDITURE INCURRED ON COMPUTER HARDWARE/SOFTWARE



COMPUTER FACILITY MANAGEMENT
ORGANIZATIONAL STRUCTURE





Tiger Habitat Corridor Analysis

Bandhavgarh-Kanha National Parks, India

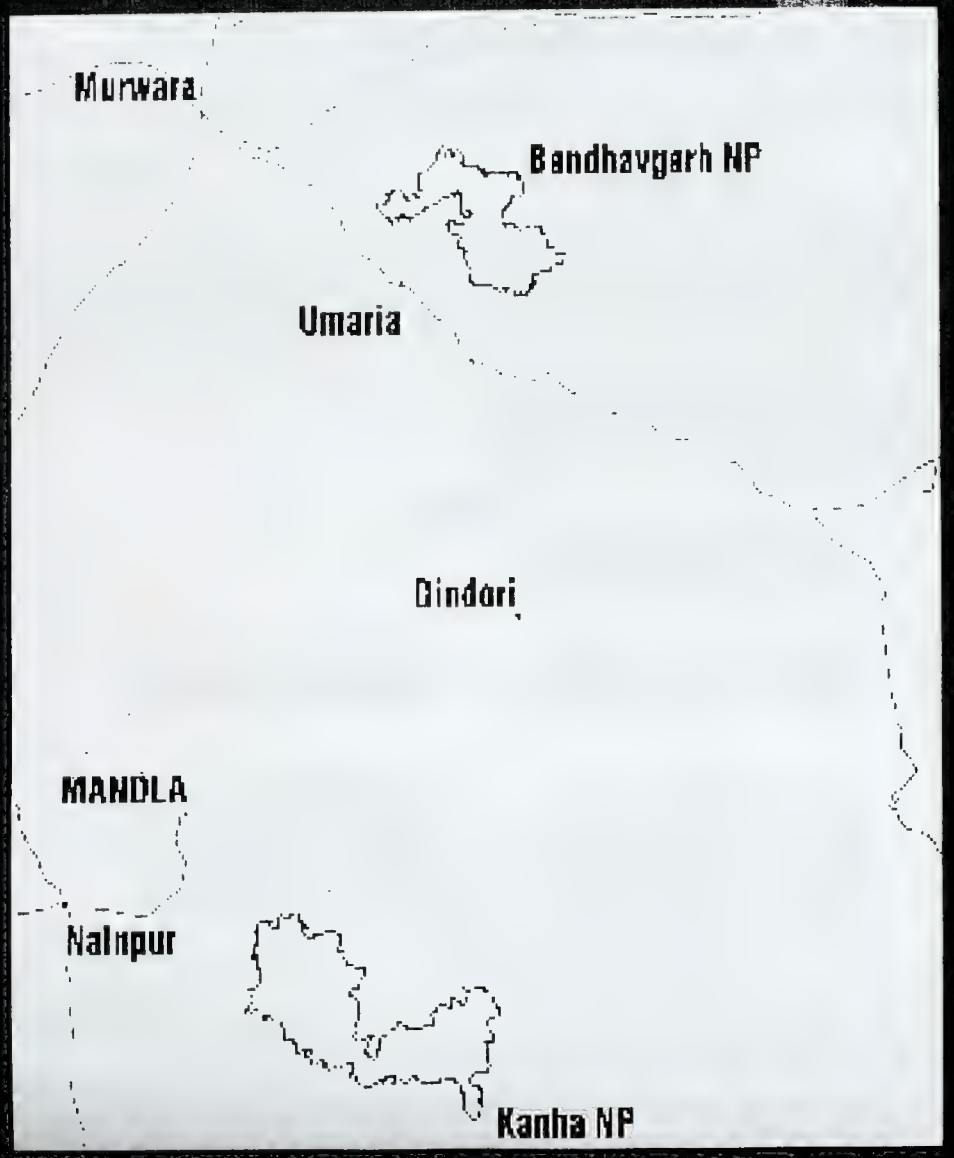
Risk From Gravel Roads

Low High

0 10 20 30 40 50 60 70 80 90 100

Kilometres

भारतीय वन्यजीव संस्थान
Wildlife Institute of India
Sierra Biodiversity Institute



Tiger Habitat Corridor Analysis

Bandhavgarh-Kanha National Parks, India

Risk From Railway Lines

Low — High

0 10 20 30 40 50 60 70 80 90 100

Kilometres

भारतीय वन्यजीव संस्थान
Wildlife Institute of India
Sierra Biodiversity Institute

Protected Area Resource Centres:
Information on the ground for those who need it most

Tom Moritz, WCPA
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The World Commission on Protected Areas and the World Conservation Monitoring Centre are collaborating on a programme to develop networks of ***Protected Areas Resource Centres***. This paper describes the key elements of the programme and the partnerships that will be developed to deliver it.

The objective of the programme is to support protected area managers worldwide through development of an integrated programme that:

- improves availability of information *resources*;
- delivers information *services*;
- increases *networking* between protected area professionals; and
- provides access to opportunities for *training* in information management and use.

Full and equitable access to information resources, services and tools is a major factor limiting the effectiveness of protected area managers worldwide. PARC is a strategic programme to provide this needed information to protected areas policy-makers and decision-makers on-the-ground and to support the collaborative exchange of information within the protected areas community and the larger sustainable development community.

Background

Protected areas are at the core of any effective strategy to sustain the health of our planet and to maintain its landscapes and biological diversity. Since the World Parks Congress in Caracas in 1992, increased attention in the international community has been focused on the information factor within the overall equation for effective protected area management.

There is much substantial information available to support protected area managers in their work, and in recent years the potential to access this information has been greatly increased by the explosive development of computer technology, the Internet and the World Wide Web as media for management, communication and exchange of information.

However, there is tremendous variation in ability to access information resources and services, and in particular gross inequities in access to the media of communication.

Typically regions most critically in need of support by whatever measure, fall within those areas least well supplied with resources, services and network media. A simple comparison such as overlaying a graph of the geographic distribution of Internet "host sites" against a graph of GDP demonstrates how closely this effect parallels global inequities in distribution of wealth.

Programme Approach

Building on resources and services that are already in place, PARC seeks to develop a comprehensive system for optimizing the existing and for the provision of new information resources and services together with support for networking and requisite training. The following approach is being taken to development and implementation of the programme.

1. Develop a clear understanding of information needs at all stages, to ensure that the information resources, services and tools being developed meet real, identified needs.

2. Develop and implement a PARC-International Centre to coordinate development of the distributed international network for protected area information resources, services, networking and training.

3. Develop information resources, services, networking and training in a modular way, working in collaboration with a wide range of organizations (see Annex).

4. Undertake 2-3 pilot implementations of PARC at the regional level, working in close collaboration with appropriate regional organizations. Key actions will include:
   - Comprehensive needs assessments throughout the region.
   - Review of regional protected area information resources and programs.
   - Survey of regional Internet services and existing Internet capacity.
   - Establishment, staffing and equipping of regional PARC node (preferably in an existing agency or institution with demonstrated capacity for regional protected area's leadership).
   - Implementation of regional resources, services, training and networking modules.

5. Extend the PARC model to all regions of the world, based on the experiences gained during the pilot project, and on the identified needs.

6. Develop networks of local PARCs to provide direct on-the-ground services, working in collaboration with local organizations, and with regional and international PARC nodes. Key actions will include:
   - Identification of suitable hosts for local PARCs, basing decisions on availability of technical infrastructure, commitment to resource sharing and established leadership.

- Establishment of local PARCs with the technical and staff capacity to serve the interests of protected area managerial and scientific staff as well as local communities.

Types of Outputs

The anticipated outputs of this programme of work would include the following.

1. A clear idea of the information needs of protected area professionals, based on a series of workshops and seminars at local regional and international levels.

2. An established PARC-International Centre based at WCMC which coordinates a distributed network of resources, services and tools (see Annex).

3. A system of regional PARCs responding to the information needs and resources of specific regions.

4. Developed networks of local PARCs responding to the immediate needs of local protected areas and the communities in which they exist.

5. Established routine procedures for feedback and auditing, to inform periodic programme reviews, evaluation and monitoring of PARC performance.

Implementation

PARC is being implemented by the IUCN World Commission on Protected Areas (WCPA) and the World Conservation Monitoring Centre (WCMC) working together in close collaboration. Other organizations are being invited to become collaborating partners as the programme develops and as needs and resources are identified. Appropriately qualified individuals are also being invited to advise in an *ad hoc* capacity.

Regional and local PARC implementation will take account of needs and capacities within the region, and will only be assigned after careful consideration by the WCPA Steering Committee.

Realizing the importance of ensuring that information services developed as part of PARC meet real user needs, the programme has begun with a series of user needs workshops and studies in Central America, Europe, the Pacific Islands and the Russian Federation.

WCPA and WCMC have also drafted a series of project concepts, and are seeking further resources for the implementation of this programme.

Annex - Potential PARC components

Resources

- comprehensive, multilingual bibliographic database of global protected areas literature (including gray literature)
- collection of core protected areas "best practice" literature available in electronic form (CD-ROM/WWW)
- PARC Web site to provide collated, interactive access to PARC resources and services
- Protected Areas Virtual Library providing coordinated access to all web sites which incorporate information on protected area systems
- core biodiversity data
- core resource materials on environmental law and policy
- core resource materials on business, management and training
- geographical/oceanographic/meteorological data in real time
- access to protected area images (including slides, video and audio)
- access to maps and spatial data including GIS files

Services

- reference services (providing mediated information services)
- current awareness services
- calendar of protected area events
- directory of protected area expertise
- listings of protected area training and academic opportunities
- information about current opportunities for grant and other fundraising
- protected area employment and volunteer opportunities
- guidelines and assistance for authors
- listing of new protected area publications with acquisitions information

Networking and resource sharing

- support for remote Internet & WWW access
- management of local, regional and international Internet LISTs and virtual conferences (thematically and geographically defined)
- Expert Services Networks (virtual consultancies) and Expert Partners Networks (virtual mentoring)
- Virtual publishing (electronic newsletters, journals, management plans, etc.)
- Document access and delivery services (including fax and Internet-based delivery)
- Development of automated translation services
- Review and implementation of standards for data and metadata to encourage the interoperability and sharing of information

Training

- Expert partners mentoring (using Internet access to provide non-compulsory mentoring)
- Virtual workshops (WWW & video) for introduction to key technologies
- Partnerships with hardware/software producers and developers to provide documentation and other training opportunities
- Best Practice guidelines and models for training ("Train the Trainer")

5. PRIORITISATION AND PROJECT DEVELOPMENT

Prioritisation and project development: Major conclusions

1 Major conclusions resulting from the discussions on concepts and principles in biodiversity information management and needs of wildlife training institutions:

- Information management includes technology, people and processes
- Technology is the easy part - getting the data together and getting it applied is harder
- Capturing and disseminating the knowledge and experience that managers have "in their heads" is a challenge
- All PA managers use information - how do we help them to use information more effectively - learning how to access and use information is a key element.
- How can World Heritage Centre assist in this process?
  (Development of Case Studies based around World Heritage sites)
- Opportunities offered by monitoring requirements of WH Convention - triangle of site managers, training and academic institutions and others

Key issues are:

1. Improving the delivery of training through collaborative development and sharing of information and resources - training modules, training materials, case studies;
2. Increasing professionalism of PA managers through better training;
3. Raising profile of the PA management profession through advocacy

- Lack of common understanding of concepts which affects the identification of data needs
  Prepare package of information on the World Heritage Convention
- Transparency and participation are critical in process of defining issues especially where there is conflict between local issues and needs and national/global priorities - training materials need to reflect this fact
- Good information products should help bridge the gap between scientific research and policy making
- Development of a spirit of trust is critical to successful operation of networks - this trust must be built over time
- Networks should coalesce around a theme but need to build linkages to other networks/information sources A network of training institutions?
- Networks need not just deal with sharing "data" - eg. because many PA managers work in an oral tradition of knowledge, a network of training institutions could capture this knowledge and make it available to others
- Capacity building needs to come early in the project life cycle because it is the key to sustaining projects in the long term.
- Important to build a network with a strong framework and partnership and a clear focus (purpose) - eg. sharing information, developing case study material
- Need a practical approach addressing the needs of PA managers wrt:
  finding information

managing information
using information
networking and sharing to build synergy and reduce duplication

2. Prioritisation in response to the needs of wildlife training institutions:

- In improving information location/capture, management and use, we need:
- development of training modules and curricula;
- development of training materials;
- development of case studies
- In doing this people at this meeting need to:
increase collaboration between institutions;
- increase sharing of resources
- develop common approaches
- Need to also increase professionalism at the site level through:
- ensuring managers know the value of information
- improve/increase training
- better networking

Identified actions for next steps

- Establish a network of training institutions to:
share experiences
- improve communication and information flow (implement regional PARCs)
develop training materials (eg. case studies)
harmonise and standardise curricula and materials where appropriate

- Needs analysis
institutional level
site level

- Capacity building
provide appropriate information management training to staff at training institutions

Day 2 Activities 1

- Planning
develop strategic plan for network of training institutions
organise African training institutions planning workshop

- Networking
website
facilitate internet connection for training institutions
exchange curricula and other related documents (free exchange of materials, at cost or for profit)
compile existing literature/information - get resource materials into libraries at RTI's (eg. WII offered to supply copies of their publications to other centres)
endorse PARC and develop proposal for Regional PARCs based at training institutions
need to link to any networks of site managers

Activities 2

- Training
  Train information management training
  - Link to WCPA Training Task Force

- Materials development
  - develop one good case study as a pilot
  - adapt and simplify WCMC handbooks

- Regional activities
  - input to monitoring of WH sites
  - organise regional meetings
  -exchange visits between institutions/regions

Considerations for project development:

Goal identified by participants

- To enhance biodiversity conservation through a strong partnership between regional training institutions

Primary objectives

- Strengthening the capacity of regional training institutions in information management
- Support and strengthen professionalism in protected area management

Activities and priority rating

Project	High	Medium	Low	Score	Rank
Web site and listserver[4]	15	0	0	12	1
Strategic plan	8	4	2	22	2
Monitoring WH sites[1]	9	5	1	22	2
Internet connection[2,4]	10	2	3	23	3
Curricula exchange[2,4]	9	3	3	24	4
Compile literature[2,4]	8	4	3	25	5
WCMC handbook review[3]	7	6	2	25	5
Train the trainer courses[1,4]	9	4	3	26	6
Case study development[1,4]	7	5	3	26	7
African workshop[1]	4	7	4	30	8
Develop regional PARCs[4]	4	7	4	30	8
Develop staff exchange program	3	8	4	31	9
Conduct regional meetings[1]	3	6	6	33	10

[1,2,3,4] indicate linked activities

6. WORKSHOP CONCLUSIONS AND RECOMMENDATIONS

Workshop recommendations

The participants at this workshop, and those who attended the meeting at Dehra Dun in 1998 agreed to establish a consortium to promote cooperation amongst regional training institutions.

1. The consortium will establish web site and list server, based at WCMC, to enhance communication and the sharing and exchange of information (e g. curricula and resource materials) and experiences.

2. Facilitate Internet access for members of consortium who do not currently have access (e.g. Garoua).

3. The participants at the workshop strongly endorse the PARC concept. The consortium will investigate the feasibility of establishing elements of regional PARCs at the Regional Training Institutions.

4. The consortium will develop a pilot project in which Regional Training Institutions, site managers and other protected area professionals jointly study/monitor a sample of World Heritage sites in order to make a more effective contribution to biodiversity conservation by improved site management, improved training delivery and improved information management.

5. The participants at the workshop endorsed the facilitating role of WCMC in further fund-raising efforts in collaboration with Regional Training Institutions.

7. ANNEXES

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WCMC Project Concept

WORLD CONSERVATION
MONITORING CENTRE

Promoting effective protected area management and decision making through sound information management: Pilot initiative with regional colleges in Africa

Executive Summary

One of the key factors limiting good conservation practice in the developing countries is the lack of reliable information upon which to make decisions. This deficiency was highlighted by a workshop hosted by WCMC in March 1999 involving the Directors of Wildlife Training Colleges from eight countries around the world. The conclusions of this workshop were that training at the field level to develop skills in collecting and managing information was essential and that a pilot project should be established in Africa as soon as possible.

It has now been agreed that this project should be coordinated by the College of African Wildlife Management at Mweka, Tanzania, with input from the training college in Cameroon and South Africa, and that the field work should focus on the nearby Kilimanjaro National Park and World Heritage Site. The long-term goal is to build the capacity of the regional wildlife training institutions throughout the developing world to produce protected area managers with the necessary skills to make decisions based on sound information.

The pilot project will run for one year. The outputs will comprise:

- a trained team in information management;
- a curricula for information management for all 3 wildlife colleges; - training materials adapted to the needs of each college;
- case study of application of learned principles and techniques for applying information management to a given protected area management issue; and
- "*Information Management Handbook for protected area managers*" for use by Regional Training Institutions of Africa and site managers.

The total cost is £53,340 of which £21,800 is for a five-day workshop in Mweka involving representatives from the three wildlife colleges in Africa.

World Conservation Training Consortium

Founding members (click to enlarge)

Photo: Participants in the UNESCO World Heritage Project Development Workshop: Integrating Biodiversity Information Management into the Curricula of Wildlife Training Institutions,WCMC, Cambridge, United Kingdom, 23-25 March 1999

World Conservation Training Consortium

- ***Consortium Strategic Plan (DRAFT)***
- ***Consortium Listserver***
- ***Consortium Founding Members***
- ***Web Links***

UNESCO World Heritage Workshop, 23-25 March 1999 at WCMC, Cambridge, UK

- ***Workshop Conclusions and Priority Actions***
- ***Workshop Summary***
- ***Workshop Report***
- ***WCMC 1999 Workshop Staff***
- ***Workshop Outline***

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http://www.wcmc.org.uk/wctc

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For more information see the World Conservation Training Consortium web site at:
http://www.wcmc.org.uk/wctc

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